

HANDBOOK

INNOVATIVE ENERGY EFFICIENCY STARTUPS IN VIETNAM: FROM IDEA TO IMPLEMENTATION



Disclaimers

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TABLE OF CONTENTS

LIST OF FIGURES	v
LIST OF TABLES	vi
THE GLOSSARY	viii
PREFACE	xii
CHAPTER 1: GENERAL INTRODUCTION	16
1.1. Why This Handbook?	17
1.2. Who Is This Handbook For?	18
1.3. How to Use This Handbook	18
1.4. Energy Efficiency in Vietnam's Transition: Why It Matters	20
1.5. The Role of EE Startups: Global Momentum and National Opportunities	21
CHAPTER 2. MAPPING VIETNAM'S ENERGY EFFICIENCY START-UP ECOSYSTEM	25
2.1. Overview	26
2.2. Sectoral Context: Where EE Innovation Happens	27
2.3. Stakeholders and Institutional Enablers	30
2.4. National and Local Programs Supporting EE Startups	40
2.5. Key Takeaways	42
2.6. Additional Resources: Ecosystem Stakeholders	43
CHAPTER 3. POLICY & LEGAL FRAMEWORK ON ENERGY EFFICIENCY STARTUP	44
3.1. Policy Trends Opening Doors for EE Innovation	45
3.2. EE Legal Framework: Turning Policy into Practice	47
3.3. Legal Framework Enabling Start-up Development in Viet Nam	51
3.4. What EE Startups Should Do	53
3.5. Additional Resources: Legal and Policy Impacts on EE Startups	54

CHAPTER 4. ESTABLISHING INNOVATIVE ENERGY EFFICIENCY START-UPS

55

4.1. Stage 1 - Ideation: Finding and Framing the Right Problem	57
4.2. Stage 2 - Validation: Proving Your Idea Has a Market.....	63
4.3. Stage 3 - Business Model Development: Architecting a Viable Enterprise.....	70
4.4. Stage 4 - Prototyping & Piloting: Making Your Solution Real	84
4.5. Stage 5 - Launch: Bringing Your Venture to the Market.....	94
4.6. Stage 6 -Scale-Up: Growing Your Impact and Your Business.....	102
4.7. References: Practical Resources for Growing an EE Startups.....	111

CHAPTER 5. FINANCE AND INVESTMENT OPPORTUNITIES

112

5.1. Funding ladder by startup stage	113
5.2. Instrument deep-dives: Choosing the Right Type of Capital.....	119
5.3. Investor-readiness toolkit	122
5.4. Closing the deal & post-investment.....	135

CHAPTER 6. HUMAN RESOURCES AND INFRASTRUCTURE FOR STARTUP DEVELOPMENT

142

6.1. Building & Developing a Team	145
6.2. Infrastructure for Scaling	151
6.3. Partnering for R&D and Talent.....	155
6.4. Common Gaps and Workarounds.....	157
6.5. Practical Tools & Templates.....	158

CHAPTER 7. TECHNOLOGY AND INNOVATION FOR ENERGY EFFICIENCY

160

7.1. Key Innovation Trends in Energy Efficiency	161
7.2. Sector-Specific Technology Applications.....	166
7.3. Key Technological Challenges	174
7.4. What Startups Should Do to Accelerate Technology Deployment	175
7.5. Intellectual Property Protection for EE Startups in Vietnam.....	176

CHAPTER 8. MARKET RESEARCH, CUSTOMER ACQUISITION, AND BRANDING

182

8.1 Understanding Your Market & Customers.....	183
8.2 Customer Journey & Conversion Funnel	196
8.3 Outreach Channels & Customer Education.....	201
8.4 Sale Enablement & Lead Conversion.....	202
8.5 Building Trust and Reputation.....	204

CHAPTER 9. GROWTH AND SCALING STRATEGIES FOR ENERGY EFFICIENCY START-UPS **211**

9.1 Are You Ready to Scale?.....212

9.2 Strategic Scaling Paths: Choosing How to Grow215

9.3 Functional Scaling Playbooks219

9.4 Risk Mitigation.....226

9.5 KPI Dashboard.....228

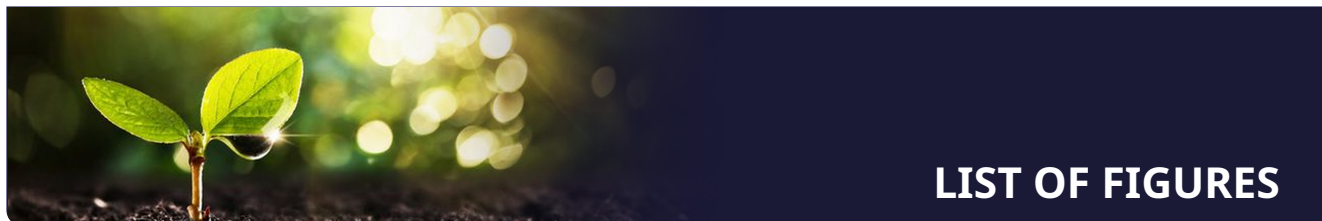
9.6 Additional Resources and Templates236

CHAPTER 10. CASE STUDIES OF ENERGY EFFICIENCY STARTUPS **237**

10.1 Case Study 01: Lumani’s LMZ2 Turning Lights Into a 40% Energy Saving Machine.....238

10.2 Case Study 02: Abivin.....243

REFERENCES **246**



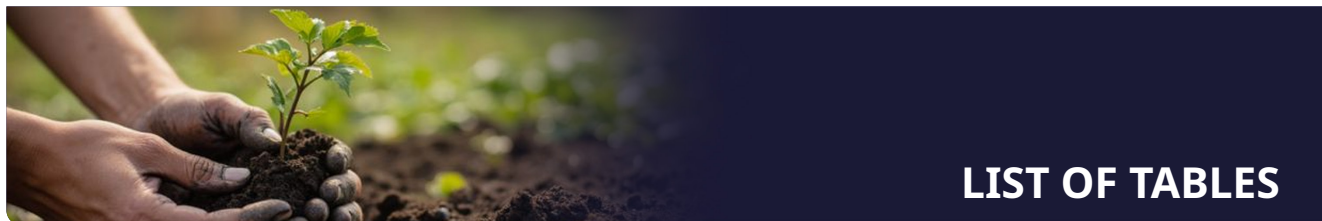
LIST OF FIGURES

Figure 1: Target Audience of the Handbook.....	18
Figure 2: Using the Handbook Sequentially	19
Figure 3: Using the Handbook Modularly	19
Figure 4: Energy intensity level of primary energy of Vietnam and some countries	21
Figure 5: Key Components of the EE Startup Ecosystem in Viet Nam	30
Figure 6: Building an Innovative Energy Efficiency Startup in Viet Nam.....	56
Figure 7: Idea to Solution Framework.....	57
Figure 8: Energy efficiency opportunities across sectors	58
Figure 9: The Design Thinking Process: From Empathy to Testing.....	59
Figure 10: How to validate the problem and market in Viet Nam?	63
Figure 11: How to Conduct Effective Customer Discovery Interviews in Viet Nam.....	65
Figure 12: What Makes a Good Prototype	85
Figure 13: Steps to successful Pilot Project.....	89
Figure 14: Strategies for securing pilot partnership	91
Figure 15: Step-by-Step: How to Build Your Core Team	146
Figure 16: LumaZones 1.0 Autonomous Ambient Management Platform Motion Sensor Collects Activity Data (Patented)	240
Figure 17: Abivin Startup's technology solutions.....	244



LIST OF TABLES

Table 1: 10 Market Drivers Every EE Startup in Viet Nam Should Watch.....	22
Table 2: Energy Efficiency Opportunities by Sector	28
Table 3: Energy Efficiency Startups' Challenges	29
Table 4: Key Stakeholder Groups in the EE Start-up Ecosystem	31
Table 5: Legal Responsibilities on Energy Efficiency by Sector	48
Table 6: Legal and Policy Instruments Supporting Startups in Viet Nam.....	51
Table 7: Five phase of Design Thinking.....	60
Table 8: Example of Applying Design Thinking in Practice	62
Table 9: Business Model Canvas.....	73
Table 10: Lean Canvas Model	74
Table 11: Comparison of Energy Efficiency (EE) Business Models.....	79
Table 12: Type of prototypes for EE Startups.....	84
Table 13: Financial Options for EE Startups in Viet Nam	105
Table 14: Summary of Business Growth Metrics.....	106
Table 15: Summary of Sustainability and Impact Metrics	107
Table 16: Summary of Operational Metrics.....	108
Table 17: Outline the typical funding ladder for startups in Viet Nam	114
Table 18: Typical Capital Raising Ladder for Deeptech Startups in Vietnam	118
Table 19: Internal Factors to Strengthen Before Fundraising.....	122
Table 20: List of Documents to Share with Investors.....	123
Table 21: One-Page Executive Summary	125
Table 22: Common Valuation Methods	127
Table 23: Standard Pitch-Deck Outline.....	131
Table 24: Common Terms in a Venture Capital (VC) Term Sheet	136
Table 25: Key Components of Investor Reports	139
Table 26: Best Practices for Investor Reporting	140
Table 27: Strategies for Maintaining Investor Engagement.....	141
Table 28: Quick Self-Check: Is Your Team Ready?.....	150
Table 29: Examples of EE-relevant infrastructure	151
Table 30: Types of Collaborations and How to Leverage Them	155
Table 31: Common Gaps.....	157



LIST OF TABLES

Table 32: Tools for early-stage EE startups	158
Table 33: Industrial energy efficiency technologies and startup solutions.....	166
Table 34: Energy efficiency technologies and startup solutions for buildings.....	168
Table 35: Energy efficiency technologies and startup solutions for transport sector	171
Table 36: Key Technological Challenges.....	174
Table 37: What Startups Should Do to Accelerate Technology Deployment.....	175
Table 38: Types of intellectual property and scope of protection.....	177
Table 39: IP Administration and Registration Procedures	179
Table 40: Importance of IP Protection for EE Startups	180
Table 41: Define your ideal customers 90	
Table 45: Analysing Industry Forces Using Porter's Five Forces.....	191
Table 46: Competitive matrix	192
Table 47: Value Proposition Canvas.....	194
Table 48: USP Positioning Matrix	195
Table 49: Four main Stages of the EE Conversion Funnel	198
Table 50: Educational Content Formats.....	200
Table 51: Sales Enablement Checklist for EE Startups.....	204
Table 52: Scaling Readiness Scorecard for Energy Efficiency Startups.....	213
Table 53: Comparison of Strategic Scaling Paths for EE Start-ups	216
Table 54: Risk-Mitigation Matrix for Scaling EE Start-ups	226
Table 55: Core Scaling KPIs for Energy Efficiency Start-ups	229



THE GLOSSARY

Abbreviation	Definition / Meaning
AIS4EE	Accelerating Innovative Startups for Energy Efficiency
BIPV	Building-Integrated Photovoltaics
BMS	Building Management System
BMC	Business Model Canvas
CFL	Compact Fluorescent Lamp
DDI	Diagnosis – Design – Implementation
IGIP	Agency for Innovation, Green Transition, and Industry Promotion
EaaS	Energy as a Service
EMS	Energy Management System
EQ	Emotional Quotient (or Emotional Intelligence)
ESCO	Energy Service Company
GEB	Green Energy Building
GHG	Greenhouse Gas
GGGI	Global Green Growth Institute
EE	Energy Efficiency
HVAC	Heating, Ventilation, and Air Conditioning
ICT	Information and Communication Technology
IoT	Internet of Things

Abbreviation	Definition / Meaning
JETP	Just Energy Transition Partnership
LED	Light Emitting Diode
MOIT	Ministry of Industry and Trade
MVP	Minimum Viable Product
NDC	Nationally Determined Contributions
PPT	PowerPoint Presentation
PV	Photovoltaic
R&D	Research and Development
R&D Lab	Research and Development Laboratory
RE	Renewable Energy
ROI	Return on Investment
SAFE	Simple Agreement for Future Equity
SEER	Seasonal Energy Efficiency Ratio
SEPT	SEPT Competence Center, Leipzig University, Germany
SIHUB	Startup and Innovation Hub of Ho Chi Minh city
SME	Small and Medium-sized Enterprise
ToR	Terms of Reference
ToT	Training of Trainers
UNFCCC	United Nations Framework Convention on Climate Change
VC	Venture Capital or Venture Capitalist
VNEEP	Vietnam National Energy Efficiency Program
VSD	Variable Speed Drive



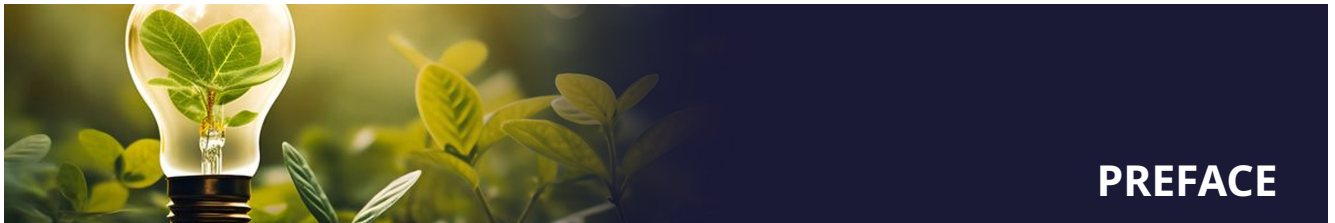
GLOSSARY OF KEY TERMS

Term	Definition
Artificial Intelligence (AI)	Artificial intelligence (AI) refers to the simulation of human intelligence in machines, enabling them to perform tasks that typically require human cognitive functions, such as understanding language, recognizing patterns, and making decisions. – Investopedia
B2B (Business-to-Business)	Commercial transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. – Investopedia
B2G (Business-to-Government)	Commercial transactions between businesses and government agencies (central, local). – Investopedia
Big Data	Big Data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation. – Oracle
Business Model	A business model is a company's plan for how it will generate revenues and make a profit. – Harvard Business Review
Circular Economy	An economic model that is an alternative to the traditional linear model (take-make-dispose), in which resources are kept in use for as long as possible, the maximum value is extracted from them whilst in use, then products and materials are recovered and regenerated at the end of their service life. – Ellen MacArthur Foundation
Economical and Efficient Use of Energy	The application of management and technical measures to reduce losses and energy consumption of means and equipment while still ensuring the needs and targets set for production and daily life. – Law on Economical and Efficient Use of Energy 2010

Term	Definition
Energy	Includes fuel, electricity, and thermal energy obtained directly or through processing from renewable and non-renewable energy resources. – Law on Economical and Efficient Use of Energy 2010
Energy Audit	The activity of measuring, analyzing, calculating, and evaluating to determine energy consumption levels, energy saving potential, and proposing solutions for economical and efficient energy use for energy-using facilities. – Law on Economical and Efficient Use of Energy 2010
Energy Transition	Energy transition refers to the global energy sector’s shift from fossil-based systems of energy production and consumption — including oil, natural gas and coal — to renewable energy sources like wind and solar, as well as lithium-ion batteries. – IRENA
Entrepreneurship	Entrepreneurship is the activity of self-employment—a process in which an individual entrepreneur clearly identifies and pursues opportunities in the economy. – Harvard Business Review
ESG (Environmental, Social, and Governance)	Three central factors used to measure the sustainability and societal impact of an investment in a company or business. – Investopedia
GHG Emission Reduction (Greenhouse Gas Emission Reduction)	An activity aimed at mitigating the level or intensity of greenhouse gas emissions, enhancing greenhouse gas sequestration. – Law on Environmental Protection 2020
Green Growth	Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. – OECD)

Term	Definition
Green Supply Chain	Comprehensive management of the product and service lifecycle from raw material extraction, production, transportation, consumption to recovery and recycling to minimize negative environmental impacts. – Srivastava, S. K. (2007)
Intellectual Property (IP)	Creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. IP is protected in law by, for example, patents, copyright and trademarks. – WIPO
Internet of Things (IoT)	The term IoT, or Internet of Things, refers to a collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves. – Oracle
Joint Stock Company (JSC)	A type of business entity in which the charter capital is divided into equal parts called shares; shareholders are liable for the debts and other property obligations of the enterprise within the scope of their contributed capital. – Law on Enterprises 2020, Clause 1, Article 111
Lean Startup Methodology	A method for developing businesses and products that aims to shorten product development cycles, measure progress scientifically, and gain valuable customer feedback. Focuses on Build-Measure-Learn. – The Lean Startup
Limited Liability Company (LLC)	A type of business entity in which the members are liable for the company's debts and obligations only to the extent of their capital contribution. – Law on Enterprises 2020, Articles 46 & 74

Term	Definition
Minimum Energy Efficiency Level	The lowest energy efficiency level prescribed by a competent state agency for means and equipment using energy, below which the equipment will be subject to special management. – Law on Economical and Efficient Use of Energy 2010
Minimum Viable Product (MVP)	A version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort. – The Lean Startup
Startup (Creative Entrepreneurship)	A startup company is an organization or company in its early stages, characterized by innovation, scalability, and rapid growth. – Investopedia
Startup Ecosystem (Creative Startup Ecosystem)	Includes individuals, groups of individuals, innovative startup enterprises, and entities supporting the development of startup enterprises, including state policies and laws; infrastructure; capital and finance; startup culture; organizations providing support services, training, consulting; universities; investors; human resources; market. – World Bank
Sustainable Development	Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. – United Nations
Value Proposition	A promise of value to be delivered, communicated, and acknowledged. It is also a belief from the customer about how value will be delivered, experienced and acquired. – Business Model Generation



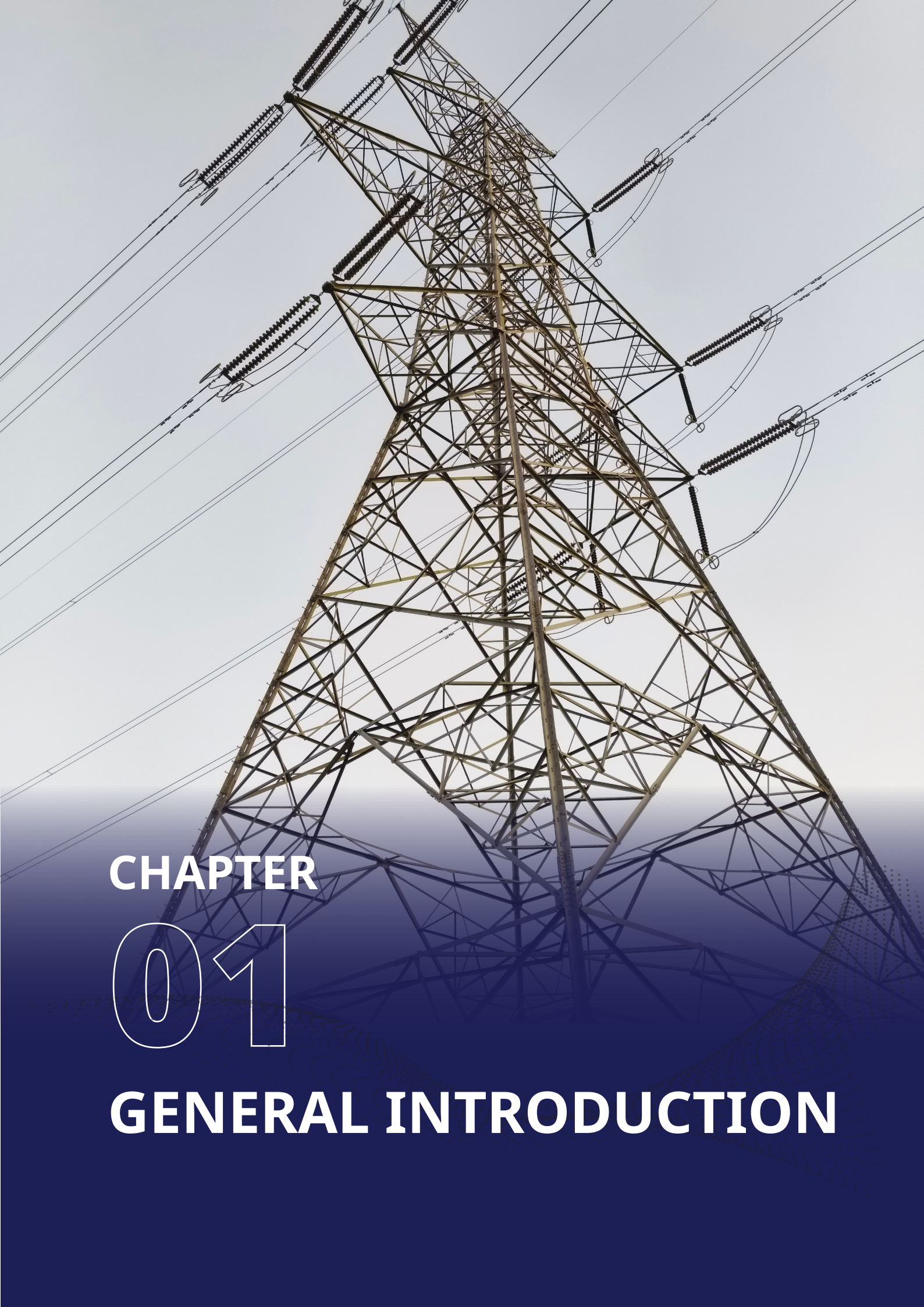
PREFACE

Viet Nam is entering a pivotal stage in its development journey, pursuing ambitious, inclusive growth while advancing its climate commitments. In this context, energy has become a source of both demand and constraint. As one of the most energy-intensive countries in East Asia, Viet Nam is under growing pressure to improve energy efficiency while sustaining economic growth. Recognizing the critical role of innovation in overcoming this challenge, the Government of Viet Nam launched the National Energy Efficiency Program (VNEEP3) for the period 2019–2030 and committed to achieving net-zero emissions by 2050, in line with its pledge at COP26.

Aligned with these national priorities, the “Accelerating Innovative Start-ups for Energy Efficiency” (AIS4EE) project was launched in 2022. Hosted by the Ministry of Industry and Trade (MOIT) with funding from the European Union (EU), the AIS4EE project forms part of the broader EU–Viet Nam Sustainable Energy Transition Programme (SETP) to support Viet Nam’s goal of sustainable energy transition towards NetZero by 2050. The AIS4EE project is co-funded and implemented by the Global Green Growth Institute (GGGI), with an aim to unlock the potential of innovative start-ups in the energy efficiency (EE) sector, particularly in industry, transportation, and buildings by improving access to investment, enhancing policy support, and strengthening the start-up ecosystem.

This handbook was developed under the AIS4EE project as a practical guide for start-ups, investors, and any ecosystem enablers working to advance EE innovation in Viet Nam. Grounded in Viet Nam’s market conditions, the handbook brings together tools, policy insights, and sector-specific strategies to help scale viable solutions in a fast-evolving landscape.

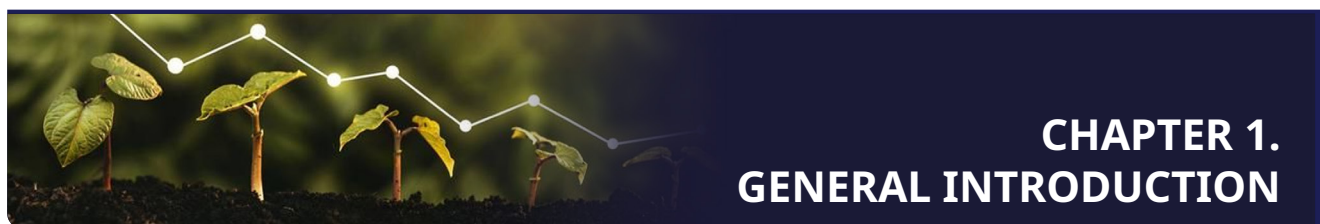
Whether you are building a venture, assessing market opportunities, or designing support for early-stage innovation in energy efficiency in Viet Nam, this handbook is for you.



CHAPTER

01

GENERAL INTRODUCTION



1.1. Why This Handbook?

As part of its Net Zero commitment by 2050, Viet Nam needs to decouple rapid economic growth from rising energy demand, dramatically reduce greenhouse gas emissions and energy intensity across all economic sectors. In this transition, energy efficiency (EE) is a key strategy, being the most cost-effective solution. And startups are uniquely positioned to lead the way and accelerate Viet Nam's decarbonization efforts.

The continuous growth of startups, both in quantity and quality, has affirmed their role as one of the key drivers of new growth, contributing significantly to the country's comprehensive development goals. From 2018 to 2024, Vietnam's startup ecosystem experienced remarkable growth. In 2018, there were approximately 3,800 active startups, with investment volumes tripling to around US \$889 million through around 92 investment deals. By the end of 2024, the number of startups had risen to over 4,000 valued at over US \$100, including two unicorns and eleven startups valued at over US \$100 million each. Investment momentum continued through 2023, with 122 deals and US \$529 million in capital—despite a 17% decline from the previous year, indicating a resilient ecosystem. In total, from 2014 to 2023, Vietnam attracted over US \$4.6 billion in startup funding across 835 deals.

Notably, energy-efficient, environment startups have emerged as fast-growing and high-impact sectors. Yet many EE-focused startups in Viet Nam face significant barriers, not only in market access and financing, but also in overcoming deep-rooted technical constraints to validation and scale.

This Handbook aims to help close these gaps by:

- Rapid decarbonization in hard-to-abate sectors (industry, transport, and buildings);
- New models of innovation such as digital EE services, performance contracting, and AI-enabled optimization;
- Strong returns on investment, particularly in energy-intensive economies.

Above all, this handbook is not just a guide, it is also an invitation to engage. We hope this handbook will equip you with the insight and direction needed to turn energy efficiency innovation into real-world impact, where startup-led solutions can drive business opportunities and contribute meaningfully to Viet Nam's EE objectives and climate commitments.

1.2. Who Is This Handbook For?

This Handbook is intended for a wide range of stakeholders within the energy efficiency and innovation ecosystem. It primarily targets two core groups:

1. **Startup & Entrepreneurs:** Use this Handbook to guide the entire startup journey—from idea generation, prototyping (MVP), and business modeling to market entry and scaling.
2. **Investors, incubators, and accelerators:** Use this handbook to understand market potential; and inform investment strategies and ecosystem engagement.

In addition, it offers relevant insights for other key actors such as policymakers, lecturers, trainers, mentors, and development partners, each of whom plays a role in shaping an enabling environment for early-stage energy efficiency innovation.



Figure 1: Target Audience of the Handbook

1.3. How to Use This Handbook

This Handbook consists of ten chapters, each structured to support different stages of the EE startup journey—from ideation and ecosystem understanding to financing, technology deployment, and scaling. Each chapter includes: Core concepts and definitions; Practical tools and templates; Case studies and examples; and Links to further resources.

The Handbook can be used flexibly: either sequentially, for a full step-by-step journey, or modularly, allowing users to direct to chapters—such as finance, legal compliance, or marketing—based on their immediate priorities or roles within the ecosystem.

Chapter 1

Overview & Rationale

Understanding the foundational concepts and reasons behind the handbook.



Mapping the Ecosystem

Identifying and analyzing the key players and dynamics within the startup environment.

CHAPTER 2

CHAPTER 3

Legal Framework

Navigating the legal and regulatory aspects essential for startup operations.



Ideas to Startup

Transforming innovative ideas into viable startup ventures.

CHAPTER 4

CHAPTER 5 & CHAPTER 6

Finance & Infrastructure

Establishing the financial and infrastructural backbone for the startup.



Technology & Scaling

Leveraging technology and marketing strategies to scale the startup.

CHAPTER 7, 8 & 9

CHAPTER 10

Case Studies

Learning from real-world examples to refine and improve startup strategies.



Figure 2: Using the Handbook Sequentially



First-Time Entrepreneurs

Start with Chapter 4, then explore Chapters 2 and 5 for foundational knowledge.

EE Background Readers

Focus on Chapters 2 and 5 for ecosystem insights and financing options.

Investors and Incubators

Begin with Chapter 2 and Chapters 7-9 for market trends and scaling strategies.

Figure 3: Using the Handbook Modularly

1.4. Energy Efficiency in Vietnam's Transition: Why It Matters

Globally, energy efficiency is often referred to as the “first fuel” of clean energy transitions. It offers an immediate, cost-effective way to reduce emissions, ease pressure on energy systems, and improve economic competitiveness.

The International Energy Agency estimates that energy efficiency must account for more than 40% of the emissions reductions needed by 2050 to reach global Net Zero targets. Between now and 2030, EE improvements could avoid emissions equivalent to the annual output of the entire EU, while lowering energy bills and enhancing system resilience². Key global opportunities include:

- Rapid decarbonization in hard-to-abate sectors (industry, transport, and buildings);
- New models of innovation such as digital EE services, performance contracting, and AI-enabled optimization;
- Strong returns on investment, particularly in energy-intensive economies.

In Vietnam, energy efficiency holds even greater strategic relevance. The country continues to experience rapid energy demand growth of 8–10% annually, while its primary energy intensity (MJ/USD at 2015 constant prices) remains high compared to regional peers, indicating substantial room for improvement. By 2030, Vietnam's energy-saving potential from improving energy efficiency is estimated to exceed \$55 billion, including around \$10 billion from industrial energy-efficiency measures and an additional \$22 billion from fuel-saving measures in the transport sector. According to VNEEP³, Vietnam still has significant untapped energy-saving potential across key sectors:

- Industry: 20–30% energy savings through modern technology and more efficient energy management;
- Buildings and Construction: 15–20% electricity savings through energy-efficient design and equipment;
- Transportation: 10–15% fuel savings through enhanced technical standards and fleet management.

Moreover, energy consumption per unit of product in many Vietnamese industries remains significantly higher than in advanced economies. Technical potential for energy savings is substantial: over 20% in industrial sectors such as cement, steel, and ceramics; more than 30% in residential buildings and transport; and considerable savings in commercial and service sectors. This inefficiency has prompted a wide range of national strategies and policy actions:

2 <https://openknowledge.worldbank.org/server/api/core/bitstreams/5087df32-556b-5c8e-a615-135d46cbf43e/content>

3 <https://vanban.chinhphu.vn/default.aspx?pageid=27160&docid=196453>

4 <https://vanban.chinhphu.vn/?pageid=27160&docid=207889>

- The National Energy Efficiency Program (VNEEP3) sets a target of 8–10% savings in total national energy consumption by 2030³;
- Power Development Plan VIII (PDP8) prioritizes demand-side management and energy efficiency integration across sectors, aiming to cut electricity demand by 7–10% compared to baseline scenarios by 2030⁴;
- The National Overall Energy Master Plan (approved under Decision 893/QD-TTg) emphasizes energy efficiency as a cornerstone to reduce final energy consumption and support Net Zero goals;
- The updated Nationally Determined Contributions (NDCs) outline a 15.2% unconditional and 43.5% conditional GHG reduction target by 2030, where energy efficiency measures play a vital role⁵;

With rising pressure from global climate obligations and growing domestic energy needs, energy efficiency has become not only an environmental imperative but a central pillar of Vietnam's sustainable development path.

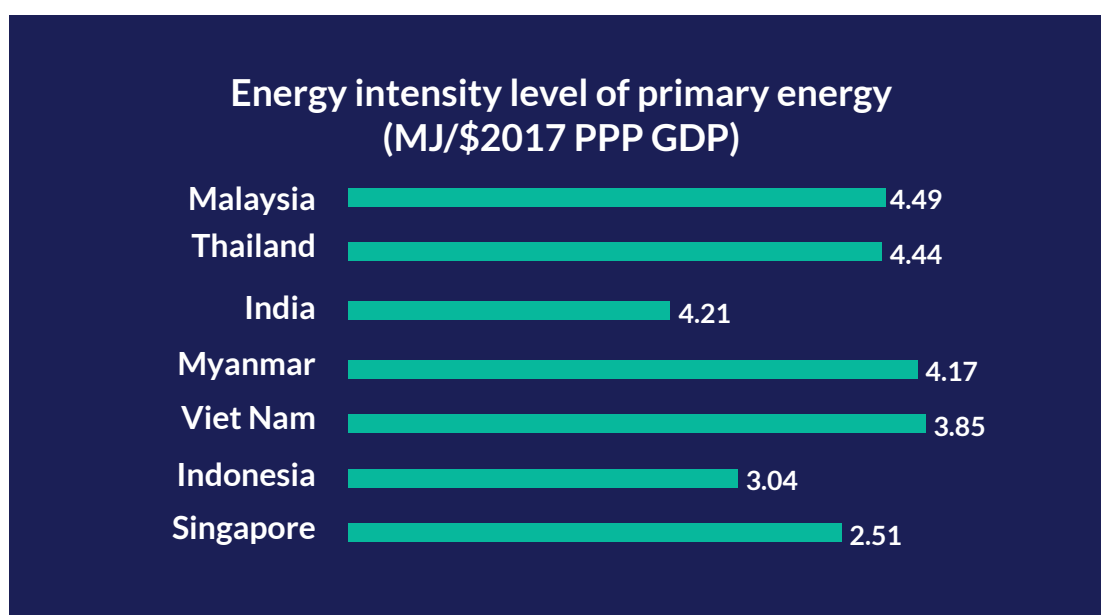


Figure 4: Energy intensity level of primary energy of Vietnam and some countries⁶

1.5. The Role of EE Startups: Global Momentum and National

EE startups are emerging as pivotal players in the global effort to achieve Net Zero emissions. According to the International Energy Agency (IEA), nearly half of the emissions reductions required to reach the Net Zero target by 2050 will depend on technologies that are still under development. This underscores the crucial role of innovation in the clean energy sector⁷. In 2022, global public spending on energy research and development

5 [http://www.dcc.gov.vn/kien-thuc/1127/Dong-gop-do-quoc-gia-tu-quyet-dinh-\(NDC\)---Cap-nhat-nam-2022.html](http://www.dcc.gov.vn/kien-thuc/1127/Dong-gop-do-quoc-gia-tu-quyet-dinh-(NDC)---Cap-nhat-nam-2022.html)

6 <https://data.worldbank.org/indicator/EG.EGY.PRIM>
PP.KD?end=2021&locations=VN&start=2000&type=points&view=map

7 IEA (2023). Energy Technology Perspectives 2023

(R&D) reached nearly USD 44 billion, of which more than 80% was allocated specifically to clean energy technologies⁸. With their flexibility and rapid capacity for innovation, startups play a key role in driving the development and deployment of clean energy solutions—particularly in hard-to-abate sectors such as construction, industry, and transport, where energy efficiency measures deliver immediate emission reductions as well as tangible cost savings.

Globally, EE startups face several common challenges, including limited access to early-stage financing, a lack of testing and validation infrastructure, and restricted access to both public and private customers. In response, many governments have proactively supported EE startups through public-private partnership models, innovation funding programs, technology testbeds, and public procurement schemes.

Notable examples include EcoLabs (Singapore), InnoEnergy (European Union), and K-Startup Centers (Korea)—ecosystems specifically designed to accelerate commercialization and scale-up of clean energy and energy efficiency solutions.

In Viet Nam, under an increasingly supportive policy environment, the energy efficiency startup ecosystem is in a stage of active development. A number of strategic policies have been issued to promote innovation and strengthen the role of the private sector, including:

- Resolution 57-NQ/TW (2024): identifying science, technology, and innovation as the main drivers of productivity and sustainable growth;
- Resolution 68-NQ/TW (2025): recognizing private enterprises as one of the key pillars in the process of national industrialization and modernization.

EE startups in Viet Nam are emerging at a time of unprecedented convergence between market demand, policy momentum, and investment flows. The table below outlines ten key market drivers shaping the opportunity landscape for innovative EE startups in Viet Nam.

8 <https://www.iea.org/commentaries/reaching-net-zero-emissions-demands-faster-innovation-but-weve-already-come-a-long-way>

Table 1: 10 Market Drivers Every EE Startup in Viet Nam Should Watch

Opportunity Driver	
Market Demand Drivers	
National Net Zero Commitments	Vietnam's 2050 net-zero target and NDCs (27% GHG reduction by 2030) are driving demand for carbon-reducing technologies and services across all sectors.
High Energy Consumption and Intensity	Viet Nam energy intensity is significantly higher than many ASEAN peers, indicating vast technical potential for efficiency gains—especially in heavy industry and buildings.
Rising Energy Costs	Continued dependence on imported fossil fuels and increasing global price volatility have raised the urgency of EE adoption among both firms and households.
Urbanization and Infrastructure Growth	Over 40% of electricity demand stems from buildings and transport—both expanding rapidly due to urbanization. EE startups can offer smart solutions in mobility, HVAC, and building retrofits.
Regulatory & Policy Enablers	
New Markets from Regulatory Shifts	Revised energy laws, mandatory audits for key energy users, and GHG reporting requirements (e.g., under Decision 01/2022/QD-TTg) are creating new markets for compliance-driven EE solutions.
Strong Policy Push for Innovation	Resolutions 57-NQ/TW (2024) and 68-NQ/TW (2025) affirm innovation, digital transformation, and private-sector dynamism as strategic drivers of economic development—offering fertile ground for EE startups.

Technology & Digitalization Enablers	
Digital Transformation and Industry 4.0	Government initiatives on digital economy and 4IR (AI, IoT, big data) present major opportunities for EE-focused digital tools in auditing, automation, smart monitoring, and demand forecasting.
Financing & Ecosystem Support	
Green Finance Availability	Vietnam's engagement in JETP, increasing donor and private capital (e.g., green bonds, concessional loans), and VC interest in climate-tech are unlocking new funding for clean startups.
Vibrant Startup Ecosystem	Vietnam's startup ecosystem ranks 5th in Southeast Asia, with national and local programs (e.g., in HCMC and Hanoi) providing grants, tax incentives, and incubation—favorable conditions for EE ventures.
Export/Global Alignment Potential	
Global Market Alignment	EE startups in Viet Nam can serve not only the domestic market but also regional and global sustainability needs, as multinationals seek energy-efficient solutions throughout their supply chains.

Startups are seizing these opportunities by delivering:

- Energy optimization applications utilizing AI, IoT, and Big Data for industrial and building sectors;
- Smart energy audit and remote diagnostic solutions based on cloud platforms, integrated with ESG and GHG emission tracking systems;
- Next-generation energy-efficient materials and equipment, including insulation, lighting, and high-efficiency motors;
- Integrated digital platforms supporting regulatory compliance, reporting, and carbon accounting;
- ESCO models employing performance-based contracting and P2P energy trading;
- Process innovation through Lean Startup methodology and Design Thinking to rapidly and effectively test MVPs.

An aerial photograph showing a dense green forest with several large, rectangular solar panel arrays installed over it. The panels are arranged in a grid pattern and are tilted at an angle. The text 'CHAPTER 02' is overlaid on the bottom left of the image.

CHAPTER

02

**MAPPING VIETNAM'S
ENERGY EFFICIENCY
START-UP ECOSYSTEM**



2.1. Overview

Entrepreneurial ecosystems are a set of entrepreneurial actors (both potential and existing), entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes that come together and interact to create the conditions in which new businesses are created and grow. They include elements such as access to finance, talent, advice, and institutional conditions such as a culture conducive to entrepreneurship and entrepreneurial networks and leadership⁹.

In the context of this handbook, the energy efficiency start-up ecosystem refers to the interconnected network of:

- Start-ups offering innovative EE technologies, services, or business models.
- Policy and regulatory bodies that create the enabling environment.
- Investors and financial institutions funding innovation and growth..
- Research and academic institutions contributing knowledge, talent, and R&D.
- Business support organizations providing incubation, acceleration, and mentorship.
- Industry partners that serve as customers, collaborators, or scale enablers.

The ecosystem also includes market intermediaries, certification bodies, and mass organizations that facilitate adoption and awareness at scale.

Vietnam's EE start-up ecosystem is emerging at the intersection of climate goals, energy security needs, and growing entrepreneurship. The country's net-zero pledge by 2050 and focus on addressing power shortages have driven policy reforms and green finance initiatives, creating fertile ground for EE innovation.

Currently, EE startups operate across various technology, data, and energy system domains—offering solutions such as intelligent automation, industrial monitoring, and AI-driven diagnostics. Although still at an early stage compared to other sectors (such as solar energy or financial technology), the EE startup ecosystem is gradually expanding, driven by supportive policies, growing market demand, and improving access to finance.

9 <https://www.oecd.org/en/about/programmes/entrepreneurial-ecosystems.html#:~:text=Entrepreneurial%20ecosystems%20are%20a%20set,come%20together%20and%20interact%20to>

2.2. Sectoral Context: Where EE Innovation Happens

2.2.1. Entrepreneurship Opportunities in EE Sectors

Opportunities in the EE sector span across multiple key economic industries, each offering distinct drivers, challenges, and technological entry points. For startups, the most promising sectors include:

- Industry – where energy consumption remains high and modernization needs are urgent.
- Buildings and construction – which are rapidly expanding under the pressure of urbanization.
- Transportation – where fuel inefficiency persists and the rate of electrification remains limited.

These are not only high-energy-consuming sectors but also strategic pillars that enable Viet Nam to simultaneously fulfill its climate commitments and enhance economic competitiveness. As such, they open up a highly promising development space for EE startups—where innovators can demonstrate value, create tangible impacts, and gradually scale up their creative solutions.

A detailed analysis of each sector's context, along with key innovation trends and opportunities for EE startups in Viet Nam, is summarized in the table below.

Table 2: Energy Efficiency Opportunities by Sector

	Overview	Trends	Business Opportunities
Industry	Accounts for over 50% of total final energy consumption; grows 7-9% annually; energy intensity 30-40% above ASEAN average ^{10 11} . High energy costs impact competitiveness, especially in steel, cement, chemicals, textiles, and food processing.	• Rising ISO 50001 demand in industrial zones • Digital retrofitting and centralized energy management • Audits required for Designated Energy Users (DEUs)	• Smart metering and energy audits • Automation and process optimization • Retrofits for motors and thermal systems • AI powered predictive diagnostics
Buildings and Construction	Consumes ~24% of national energy (16% residential, 8% commercial). Urbanization and expanding construction drive 8-10% annual energy growth ^{12 13} . Cooling, lighting, and appliances remain inefficient.	• More green building certifications (e.g., LOTUS, EDGE) • EE regulations in national technical regulations for the construction sector • Smart city and urban planning integration	• Smart thermostats and efficient lighting • Passive cooling and ventilation • Building energy management systems (BEMS) • Energy retrofitting and audits
Transportation	Consumes ~18% of final energy, with road transport making up 80-85%. Fuel efficiency 25-40% below ¹⁴ . Fleet aging, limited electrification, and inefficient logistics raise energy use and emissions.	• Incentives for electric motorbikes and buses • Clean logistics partnerships • Digitalization of freight and deliveries	• Smart metering and energy audits • Automation and process optimization • Retrofits for motors and thermal systems • AI powered predictive diagnostics

10 Institute of Energy (2023). Viet Nam Energy Statistics 2023 Annual Report.

11 MOIT & UNIDO (2023). Energy Consumption Patterns in Food Processing Industries in Vietnam.

12 Institute of Energy (2023). Viet Nam Energy Statistics 2023 Annual Report.

13 Ministry of Construction & UNDP (2022). Viet Nam Building Energy Performance Study.

14 Institute of Energy (2023). Viet Nam Energy Statistics 2023 Annual Report.

2.2.2. Cross-Sector Solutions: Digital Innovation in Energy Efficiency

Beyond sector-specific innovations, EE start-ups can unlock substantial value through cross-cutting digital solutions that enhance performance across multiple industries. These technologies serve as a critical enabler for real-time monitoring, predictive analytics, and automation—offering scalable and data-driven approaches to reducing energy use and emissions.

As Viet Nam accelerates its digital transformation and embraces smart infrastructure, digital EE solutions are becoming increasingly indispensable. From industrial zones to office buildings and logistics fleets, digital platforms are helping to optimize energy consumption, improve equipment reliability, and align operations with ESG (Environmental, Social, and Governance) goals. In particular, prominent trends include:

- Rapid adoption of IoT sensors and smart metering systems for granular energy data collection
- Integration of AI and machine learning for diagnostics, fault detection, and optimization
- Growing pressure from investors and regulators for digital ESG and carbon reporting tools
- Exploration of blockchain for transparency in energy transactions and certificate tracking

Table 3: Energy Efficiency Startups' Challenges

Challenge	Description
Slow Market Uptake	Industrial clients often require long pilot cycles and face high switching costs, delaying adoption.
Limited Access to Finance	EE projects often lack tangible assets for collateral; green loan procedures are complex and unfamiliar to early-stage ventures.
Fragmented Support Ecosystem	EE policies and incentive programs differ across ministries and provinces, creating complexity for compliance and participation.
Low Awareness & Trust	Many customers are unfamiliar with new EE technologies, requiring time-consuming education and validation efforts.
Talent and Technical Gaps	Start-ups struggle to find interdisciplinary talent (engineering + business) and access testing infrastructure for hardware-based solutions.

To overcome the aforementioned challenges, EE startups should refer to Chapter 3 for insights into the policy and legal framework; Chapter 5 to understand the fundraising journey, financial instruments, and the process of working with investors for success; Chapter 6 to prepare the resources and infrastructure necessary for startup development; and Chapter 8 to build effective customer acquisition strategies.

2.3. Stakeholders and Institutional Enablers

A vibrant EE start-up ecosystem depends on the coordinated involvement of a diverse set of actors. These stakeholders not only influence the policy and market environment but also provide the resources, knowledge, and partnerships necessary for early-stage innovation to thrive and scale. The key categories are outlined below:

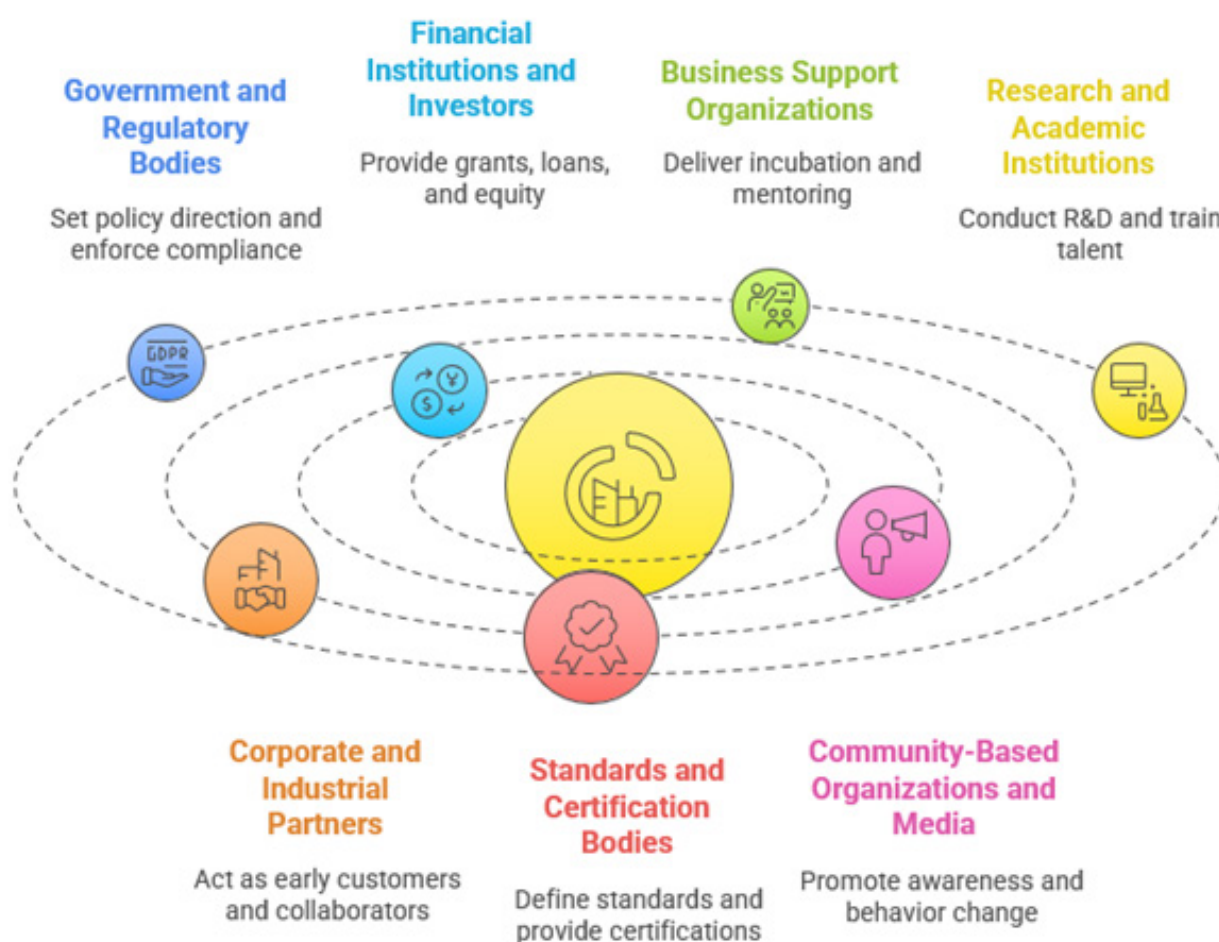


Figure 5: Key Components of the EE Startup Ecosystem in Viet Nam

Table 4: Key Stakeholder Groups in the EE Start-up Ecosystem

	Who They Are	Why They Matter for EE Start-ups	How to Work with Them	Example(s)
Government and Regulatory Bodies	Ministries, Departments, and agencies set policy direction, enforce compliance, provide enabling frameworks for EE in industry, buildings, and transport.	Create market demand via regulations; offer public programs, incentives, and pilot opportunities.	Comply with standards and regulations issued by relevant ministries and agencies (e.g., technical, energy, financial, environmental standards); Participate in providing solutions and services under programs and projects implemented by ministries and local departments;	Ministry of Industry and Trade (MOIT) – Leads the National Energy Efficiency Program (VNEEP); sets energy performance standards.
Financial Institutions and Investors	Venture capital and impact investors; local and regional banks; and development finance institutions and donors provide grants, loans, equity, etc.	Catalyze innovation, de-risk models, and support scale-up; shape bankability expectations.	Participate in pilot programs or guarantee mechanisms, technical assistance schemes, incubation programs, and blended finance models.	VCB and BIDV provide loans for EE investment projects SHB provides credit for energy-saving investment loan projects in Vietnamese industries
Business Support Organizations	Incubators and accelerators; Start-up networks and ecosystem platforms; and Industry associations and chambers of commerce deliver incubation, acceleration, mentoring, and capacity building for start-ups.	Reduce time-to-market, enhance business readiness, and connect to markets and investors.	Participate in incubation and acceleration programs. Attend conferences, exhibitions, and thematic forums. Register as a member or technical collaborator	The Vietnam Energy Incubator Program is designed to support start-up teams working in the fields of clean energy and energy efficiency. The program provides incubation services, training, and connections to investors.
Research and Academic Institutions	Universities and Research Institutes conduct applied R&D, train technical talent, and support tech transfer.	Enable prototyping, technical validation, and access to skilled workforce.	Carry out funded R&D projects or client-commissioned research and development. Access laboratories, maker spaces, and simulation tools to test and validate EE solutions. Recruit interns to supplement resources	Ho Chi Minh City University of Technology and Education (HCMUTE) has officially launched its Maker Space, aiming to support creative needs in scientific research and technology transfer. HUST, VNU, EPU, HaUI, HUS and subordinate unit provide essential research and training in this field.

	Who They Are	Why They Matter for EE Start-ups	How to Work with Them	Example(s)
Corporate and Industrial Partners	Industrial Parks and Export Processing Zones (EPZs), Construction and Real Estate Developers, Energy Service Companies (ESCOs) and Utilities, Multinational Corporations (MNCs) act as early customers, pilot hosts, or collaborators in deployment.	Provide real-world use cases, revenue pathways, and partnership models for scale.	Become a provider of energy efficiency (EE) solutions and technologies Provide consultancy and internal training for enterprises	PV Power is exploring the provision of green power and energy efficiency solutions for Vingroup.
Standards and Certification Bodies	Define EE standards, Green Building Certifications provide performance certifications, and enable MRV systems.	Ensure credibility, support access to green finance and certification-driven markets.	Comply with national technical standards (TCVN) and Measurement, Reporting, and Verification (MRV) frameworks to ensure regulatory acceptance and performance transparency. Engage in standard-setting networks, technical workshops, and policy forums to stay informed and contribute to market-shaping discussions.	Daikin Vietnam's headquarters has registered for three green building certifications: LEED, LOTUS, and WELL.
Community-Based Organizations and Media	Mass organizations, NGOs and advocacy groups, Media and communication partners promote EE awareness, behavior change, and local adoption through outreach.	Build user trust, support piloting, and drive bottom-up demand.	Collaborate to implement community outreach and awareness campaigns	KisStartup will act as the official outreach partner for the LowCarbon.Earth Program in Vietnam, supporting the promotion and recruitment of startups, particularly in the climate tech sector

2.3.1 Government and Regulatory Bodies

The energy efficiency start-up ecosystem in Viet Nam is shaped by governmental and regulatory bodies whose mandates span a wide range of areas—from industrial policy, urban development, transportation, and science and technology to finance and climate governance. These stakeholders can be classified into three groups based on their primary focus areas and policy functions:

Industrial EE Policy Makers:

- **Ministry of Industry and Trade (MOIT):** the central authority for industrial EE strategy and regulation in Vietnam. It leads the implementation of the Law on Energy Efficiency and Conservation, and coordinates national programs such as the Viet Nam National Energy Efficiency Program (VNEEP3). Through its specialized department—Agency on Innovation, Green Transition and Industrial Promotion, MOIT provides regulation, technical guidance to catalyze market-driven efficiency improvements.
- **Provincial Departments of Industry and Trade (DOITs):** DOITs implement industrial EE policies at the provincial level.

Building and Transportation EE Policy Makers:

- **Ministry of Construction (MOC):** MOC is responsible for setting and updating energy efficiency standards in the building sector, promotes green buildings, guides urban planning aligned with smart city and sustainability goals, and oversees infrastructure development projects with embedded energy performance requirements. MOC also plays a cross-cutting role in shaping transport-related infrastructure and influencing energy standards in construction and public transport systems—offering entry points for EE start-ups in areas such as building retrofits, smart controls, and electrified mobility infrastructure.
- **Provincial Departments of Construction (DOCs):** DOCs implement national regulations at the provincial level by enforcing building energy codes, and rolling out smart city and green infrastructure initiatives. These departments are key partners in deploying EE solutions in municipal projects, especially in rapidly urbanizing cities where energy demand is surging.

Cross-Sectoral EE Policy Makers and Enabling Institutions

- **Ministry of Science and Technology (MOST):** As the central policy-making authority for science, technology, and innovation, MOST formulates national strategies to promote technological entrepreneurship and R&D commercialization. It designs legal and institutional frameworks to support start-up incubation and technology transfer. Through the National Agency for Technology Entrepreneurship and Commercialization (NATEC), MOST launches funding programs, start-up and

Commercialization (NATEC), MOST launches funding programs, start-up competitions, and advisory services—many of which are applicable to cleantech and EE start-ups.

- **Ministry of Finance (MOF):** is the key policy maker overseeing both green finance and private sector innovation. MOF designs fiscal incentives such as tax breaks,
- **Ministry of Finance (MOF):** is the key policy maker overseeing both green finance and private sector innovation. MOF designs fiscal incentives such as tax breaks, preferential loans, and Vietnam's green finance taxonomy to attract EE investments. Through flagship initiatives like the National Innovation Center (NIC), MOF supports infrastructure, business services, and investor connections for start-ups, while also coordinating national strategies for SME growth and innovation.
- **Ministry of Agriculture and Environment (MAE):** MAE is the lead policy maker on climate change and environmental governance. It defines Vietnam's strategies for implementing Nationally Determined Contributions (NDCs), establishing Measurement, Reporting, and Verification (MRV) frameworks, and piloting carbon market mechanisms. These policy tools directly impact the eligibility of EE start-ups to participate in climate finance, offset markets, and green compliance initiatives.

2.3.2 Financial Institutions and Investors

In recent years, investment has accelerated significantly, though overall funding remains modest compared to the country's climate and innovation potential. According to the Vietnam Climate Tech Funding Ecosystem Report 2024 by New Energy Nexus, between 2015 and 2023, approximately USD 93 million was invested in more than 120 climate-tech projects, with nearly 50 startups receiving venture capital funding. Most of these deals were concentrated in the seed or Series A stages (accounting for around 47%)—indicating that the ecosystem is still in its early stages of development. At the same time, climate-tech investments accounted for only about 4% of total venture capital in 2023, much lower than the global average of around 10%. In short, climate technology—particularly energy efficiency (EE)—is emerging as a bright spot in Viet Nam's startup landscape but still attracts less capital than its potential warrants. Early funding successes and positive policy signals suggest that this sector is approaching a turning point, with expectations of larger investment inflows in the coming years. The financial landscape for EE startups in Viet Nam consists of three main groups of actors:

18 <https://www.vsvcapital.com.vn/>

19 <https://touchstone.vc/>

20 <https://beaconfund.com/>

21 <https://www.earth.vc/>

- Venture capital and impact investors;
- Local and regional banks;
- Development finance institutions and international donors.

The coordination among these groups enables startups to access capital throughout the venture lifecycle—helping reduce innovation risks, unlock markets, and scale up impact, especially in capital-intensive sectors such as industry, construction, and smart infrastructure.

Venture Capitals (VC): A growing number of local and regional VC firms are directing capital toward climate-tech, cleantech, and energy efficiency solutions. These investors typically seek scalable, tech-enabled business models with measurable environmental or social impact. Representative venture capital (VC) firms operating in Viet Nam include: VSV Capital, Touchstone Partners, Beacon Fund, Earth Venture Capital, ...

Tips for EE Start-ups:

To attract VC funding, EE start-ups must demonstrate scalable potential, clear impact metrics (e.g., kWh saved, tCO₂e avoided), and a robust business case. Engaging with VCs early, even during piloting stages, can open doors to strategic partnerships and follow-on funding

Commercial Banks: Domestic banks are beginning to expand their green finance portfolios, driven by: (i) supportive policy frameworks; (ii) partnerships with international partners; and (iii) growing demand from enterprises aligned with ESG goals. Some notable examples of green bond frameworks and sustainable finance initiatives among Vietnamese banks include: BIDV²², Vietcombank²³, HDBank²⁴...

Tips for EE Start-ups:

Start-ups should build financial literacy, strengthen impact reporting, and engage early with pilot programs or bank guarantee mechanisms to improve bankability and increase their attractiveness to financial institutions.

22 <https://bidv.com.vn/bidv/tin-tuc/tin-ve-bidv/bidv-thong-bao-ban-hanh-khung-trai-phieu-xanh>

23 https://www.vietcombank.com.vn/vi-VN/Trang-thong-tin-dien-tu/Articles/2024/11/14/20241114_khung-trai-phieu-xanh

24 https://cdn.hdbank.com.vn/hdbank-file/investor/editor/SRIFUyc22h9ckFv5jCqY20241223111455/FinalKHUNGTCBV13122024_1734927369856.pdf

Development Finance Institutions and Donors: provide concessional finance, technical assistance, and policy support, while working closely with government and financial institutions to pilot innovative funding models and unlock private capital. Refer to key projects and funding sources from international organizations:

- **World Bank:** the Viet Nam Scaling Up Energy Efficiency Project (VSUEE) , which provides financial and technical support to promote large-scale energy efficiency investments in the industrial sector, with funding of approximately USD 86.3 million from the Green Climate Fund (GCF).
- **Asian Development Bank (ADB):** is providing a US \$95 million loan under the Smart and Energy Efficient City Project to upgrade street lighting and retrofit public buildings for improved energy performance in six provinces²⁶.
- **Swiss Economic Cooperation and Development (SECO):** SECO funded a US \$5 million grant (via the World Bank) in November 2024 to support green and resilient urban growth in major cities like Ho Chi Minh City, Da Nang, and Can Tho, helping integrate climate-resilient planning and low-carbon transport systems into city development efforts²⁷.
- **The French Development Agency (AFD):** AFD has supported the development of energy transition roadmaps to help Viet Nam meet its carbon reduction targets and fulfill its net-zero commitments.
- **Japan Bank for International Cooperation (JBIC):** JBIC is a strategic partner of Viet Nam in providing green finance, facilitating technology transfer, and supporting institutional development to accelerate the transition toward a low-carbon economy and efficient energy use.

Tips for EE Start-ups:

Start-ups can benefit from technical assistance grants, incubation programs, and blended finance models initiated by development partners—especially when operating in underserved sectors or piloting innovative models.

25 <https://vsuee.vn/>

26 <https://hanoitimes.vn/adb-vietnam-cooperate-on-energy-efficiency-project-for-urban-lighting-586609.html>

27 <https://www.worldbank.org/en/news/press-release/2024/11/04/world-bank-and-seco-help-boost-viet-nam-s-sustainable-urban-development-with-5-million-grant>

2.3.3 Business Support Organizations

Incubators and Accelerators: provide early-stage support to help start-ups refine their business models, validate technologies, and prepare for fundraising. They often offer structured programming such as bootcamps, demo days, mentorship, and pilot facilitation with corporates or local governments. Some representative supporting organizations include: NIC (National Innovation)²⁸, SIHUB (Startup & Innovation Hub of Ho Chi Minh)²⁹, BK-Holdings (Hanoi University of Science and Technology)³⁰, DNES (Da Nang Entrepreneurship Support)³¹, BambuUP³², KisStartup³³,...

Start-up Networks and Ecosystem Platforms: These platforms help EE start-ups build visibility, share knowledge, and engage with broader entrepreneurship and innovation communities.

- ENTECH Viet Nam – International Exhibition on Energy & Environmental Technology.
- TECHFEST Vietnam: The largest national platform for Vietnamese start-ups to showcase solutions and connect with investors.
- Viet Nam Angel Network (VAN): Supports angel investors and early-stage entrepreneurs with deal flow, capacity building, and investment matching.
- SAIGONTEL Open Innovation Hub (Soihub): With a focus on emerging technologies such as artificial intelligence, smart manufacturing, and circular economy solutions,

SoiHub fosters cross-sector collaboration, international partnerships, and practical technology application³⁴.

2.3.4 Industry Associations and Chambers of Commerce

These entities connect EE start-ups with potential customers, strategic partners, and platforms for policy dialogue. They also play an important role in shaping market standards, promoting industry best practices, and linking start-ups to pilot opportunities. Some representative organizations include: Viet Nam Chamber of Commerce and

28 <https://nic.gov.vn/>

29 <https://sihub.gov.vn/>

30 <https://bkholdings.com.vn/>

31 <https://dnes.vn/>

32 <https://bambuup.com/>

33 <https://www.kisstartup.com/vi>

34 <http://saigontel.vn/vi/>

Industry (VCCI)³⁵, Viet Nam Green Building Council (VGBC)³⁶, Viet Nam Energy Efficiency Network (VSSE)³⁷, Viet Nam Association for Building Materials (VABM)³⁸, Viet Nam Transportation Association (VATA)³⁹, Viet Nam Association of Civil Engineering Environment (VACEE)⁴⁰,...

2.3.5 Research and Academic Institutions

Research and Academic Institutions play a foundational role, these institutions are instrumental in advancing Vietnam's EE innovation ecosystem by developing skilled technical talent, driving applied research, and facilitating the crucial link from knowledge creation to commercialization.

Leading Universities with EE and Clean Energy Focus: Hanoi University of Science and Technology (HUST)⁴¹, Electric Power University (EPU)⁴², Ho Chi Minh City University of Technology (HCMUT)⁴³, Vietnam–Germany University (VGU)⁴⁴, Da Nang University of Science and Technology (DUT)⁴⁵

Specialized Research Institutes and Energy Centers: These institutions conduct applied research, develop technical guidelines, and provide capacity building to EE implementation across sectors. Many serve as technical partners to government agencies, international donors, and private actors in pilot projects and policy development: Energy Efficiency and Conservation Center (EECC) Network, Viet Nam Institute for Building Science and Technology (IBST)⁴⁶ - under Transport Development and Strategy Institute (TDSI)⁴⁷ – under the Ministry of Transport, as well as specialized laboratories and research centers at universities such as HUST, HCMUT, and VGU, which focus on smart infrastructure, green transportation, and industrial energy efficiency. These institutions often collaborate on research, training, and pilot projects with startups and government agencies.

35 <https://vcci.com.vn/>

36 <https://www.vgbc.vn/>

37 <https://vsse.vn/>

38 <http://hoivlxdvn.org.vn/trangchu.html>

39 <http://hiephoivantaioto.vn/>

40 <https://moitruongxaydung.vn/>

41 <https://hust.edu.vn/>

42 <https://epu.edu.vn/>

43 <https://hcmut.edu.vn/>

44 <https://vgu.edu.vn/vi/home>

45 <https://dut.udn.vn/>

46 <https://ibst.vn/>

47 <https://mt.gov.vn/vn>

2.3.6 Corporate and Industrial Partners

With their robust infrastructure, abundant capital, and operational complexity, corporations provide startups with invaluable opportunities to pilot, validate, and deploy high-impact EE innovations. They are a fundamental component of the ecosystem, serving not only as end-users but also as critical partners that support startups in scaling and development.

Under growing pressure to meet Environmental, Social, and Governance (ESG) targets and reduce energy costs, corporations have become natural allies for innovation in the EE sector.

2.3.7 Standards and Certification Bodies

These entities are fundamental to building trust, credibility, and market acceptance for EE startups. They ensure that EE solutions' performance—especially their energy savings and environmental impact—is accurately measured, verified, and reported. Key Organizations and Frameworks:

- **National Technical Standards:** TCVN (Viet Nam Standards) and QCVN (Viet Nam Technical Regulations): These are the national benchmarks that define minimum performance criteria and safety requirements for energy-consuming equipment, building materials, and energy systems. EE start-ups offering hardware or building-integrated solutions must align with these standards to obtain market access and avoid regulatory bottlenecks.
- **Green Building Certifications:**
 - **EDGE (Excellence in Design for Greater Efficiencies):** An internationally recognized green building certification developed by IFC, increasingly adopted in Vietnam.
 - **LOTUS:** Vietnam's own green building rating system developed by the Viet Nam Green Building Council (VGBC), with criteria tailored to local climate and market conditions.
 - **LEED (Leadership in Energy and Environmental Design):** A global standard that is widely used in high-end commercial and institutional buildings in Vietnam.

Start-ups can align their solutions (e.g., smart lighting, HVAC optimization, passive cooling) with certification criteria to support clients in achieving these green building standards.

- **Measurement, Reporting, and Verification (MRV) Frameworks:**

- MRV systems are essential for EE projects implemented by Energy Service Companies (ESCOs) and for projects seeking carbon credit certification under mechanisms like JCM (Japan–Viet Nam Joint Crediting Mechanism) or Article 6 of the Paris Agreement.
- Accurate implementation of MRV ensures that energy savings and emission reductions are properly quantified, verified, and audited—an increasingly critical requirement for accessing green finance and carbon markets.

2.3.8 Community-Based Organizations and Communication Partners

These organizations help raise awareness of energy efficiency (EE), promote sustainable practices, and support startups in directly engaging with local communities and end users.

They are essential forces for scaling up adoption, particularly among households, small and medium-sized enterprises (SMEs), and underserved groups. Key actors include: mass organizations (such as the Women’s Union and the Youth Union), non-governmental organizations (NGOs), and media partners.

2.4. National and Local Programs Supporting EE Startups

The policy and innovation landscape in Viet Nam is rapidly evolving to support startups in the fields of energy efficiency (EE) and climate technology. An increasing number of national strategies and city-level initiatives are being implemented to create a more enabling environment for early-stage startups—not only in terms of finance and infrastructure, but also in market access and collaboration opportunities. Below are some key initiatives shaping the development of Viet Nam’s energy efficiency startup ecosystem:

2.4.1 National-Level Initiatives

- **VNEEP-3 (Viet Nam National Energy Efficiency Program 2019–2030):** A comprehensive program promoting energy conservation across industry, construction, and transport. It provides technical assistance, capacity building, and partial funding for EE solutions such as energy audits, ISO 50001, and ESCO projects—creating demand for innovative start-ups.
- **National Green Growth Strategy (2021–2030, Vision to 2050):** Promotes resource efficiency, green production, and green consumption. It encourages innovation in EE technologies and the development of green financial mechanisms to support cleantech entrepreneurship.

- **National Technology Innovation Fund (NATIF):** Provides concessional loans and grants for high-potential innovation projects, including those focused on energy efficiency and green technologies. EE start-ups can access funding for R&D, piloting, and commercialization stages.

2.4.2 City-Level Initiatives

- **Ha Noi City**
 - Hanoi Innovation and Startup Ecosystem Program: Overseen by the Department of Science and Technology, this program funds start-ups and connects them with research institutions like HUST.
 - TechFest Hanoi & SpeedUp Hanoi: Events and funding schemes supporting early-stage tech and green ventures.
 - Hanoi SME Support Center: Offers training, mentoring, and policy incentives for small enterprises adopting EE technologies.
- **Da Nang City**
 - DNES (Da Nang Business Incubator): One of Vietnam's first public-private incubators with strong focus on cleantech and urban innovation.
 - Da Nang Hi-Tech Park: Provides land, tax incentives, and support for technology start-ups, including EE and smart infrastructure firms.
 - Smart City & Climate Adaptation Programs: Create real-life demand and piloting opportunities for EE innovations in buildings and mobility.
- **Ho Chi Minh City**
 - SIHUB (Startup & Innovation Hub): The most active city-run incubator, offering acceleration, networking, and market entry support to start-ups across sectors including energy and sustainability.
 - TechFest HCMC & Startup Viet Nam Foundation: Promote investor engagement and policy dialogue around innovation.
 - Partnerships with private developers: Enable piloting of EE retrofits and smart energy solutions in commercial and residential buildings.

2.5 Key Takeaways

Viet Nam's EE start-up ecosystem is strategically backed by national goals, supported by local initiatives, and increasingly aligned with market demand.

- Startups have strong entry points in sectors like industry, buildings, transport, and digital solutions.
- Despite structural challenges, new finance and regulatory frameworks are opening practical pathways for innovation.
- Better coordination, technical support, and awareness can help unlock scale for early-stage EE ventures.
- **High-Potential Sectors for EE Innovation:**
 - **Industry:** High energy intensity and policy-driven audits (e.g. ISO 50001, DEUs) create strong demand for smart retrofits, automation, and diagnostics.
 - **Buildings and Construction:** Rapid urbanization and evolving green building standards open opportunities for smart controls, BEMS, and energy efficient, energy-saving materials and energy efficiency labeling for building materials.
 - **Transportation:** Growing demand for EVs, route optimization, and low-emission logistics, especially in urban freight.
 - **Cross-sectoral Digital Solutions:** AI, IoT, and MRV systems provide scalable tools applicable across multiple sectors.
- **Key Ecosystem Enablers:**
 - **Policy Makers:** Ministries such as MOIT, MOC, and MOST drive regulatory frameworks, national programs (VNEEP3), and innovation strategies.
 - **Finance Providers:** Impact VCs (e.g. VSV Capital, Touchstone Partners), development banks (e.g. ADB, IFC), and local banks (e.g. BIDV) are expanding green finance options.
 - **Business Support Networks:** Incubators (e.g. NIC, SIHUB), accelerators (e.g. BK-Holdings), and ecosystem platforms (e.g. TECHFEST) offer incubation, mentorship, and pilot support.
 - **Research and Academia:** Leading universities (HUST, HCMUT, VGU) and institutes (IE, IBST, TDSI) provide R&D, labs, and technical validation.
 - **Corporate Partners:** Industrial zones, ESCOs, MNCs offer deployment platforms and scale-up opportunities.
 - **Community & Media Actors:** Mass organizations and advocacy groups raise awareness and build user trust in new EE solutions.

2.6 Additional Resources: Ecosystem Stakeholders

A set of ecosystem resources has been compiled. These stakeholders provide incubation, funding, testing infrastructure, and professional networks that are critical for startup growth and scaling.

- Resource #1 – Incubators and Accelerators
- Resource #2 – Investors and Funders
- Resource #3 – Pilot Resources and Makerspaces
- Resource #4 – Associations and Professional Networks

The full directory of ecosystem stakeholders, including contact details and partnership opportunities, can be accessed by scanning the QR code below.



CHAPTER

03

**POLICY & LEGAL FRAMEWORK
ON ENERGY EFFICIENCY
STARTUP**



Viet Nam’s evolving EE framework defines priority areas across industry, construction, and transport, while also offering cross-cutting incentives for innovation, green finance, and startup development. Being informed helps startups:

- Identify market opportunities driven by mandatory EE requirements in energy-intensive sectors.
- Access policy incentives—such as tax breaks, preferential loans, and government-funded pilot programs.
- Leverage national support schemes for innovation, SMEs, and green technologies.
- Reduce risks and delays by aligning solutions with current standards and legal procedures.

In conclusion, a thorough understanding of legal regulations enables Energy Efficiency Startups to develop policy-aligned solutions, leverage government support mechanisms, and confidently scale within the current legal framework.

This chapter provides an overview of Vietnam’s key policy orientations regarding Energy Efficiency, Innovation, and Innovative Entrepreneurship; introduces the EE legal and regulatory framework across major sectors; and analyzes how these regulations open up opportunities for startups.

3.1 Policy Trends Opening Doors for EE Innovation

National Innovation & Digitalization Strategy: Resolution No. 57-NQ/TW (December 2024) identifies science, technology, innovation, and digital transformation as top national priorities. The resolution emphasizes the central role of enterprises and citizens—particularly innovative startups and SMEs—in driving this process. The innovation-driven startup development strategy prioritizes strategic sectors such as digital technology, clean energy, and smart cities, while promoting flexible financial mechanisms, public investment in R&D and digital infrastructure, and public-private partnerships (PPPs) to accelerate commercialization and adoption of new solutions.

Private Sector Development Strategy: Resolution No. 68-NQ/TW (May 2025) positions the private sector—especially innovative startups and small and medium-sized enterprises—as a key driver of green growth, digital transformation, and sustainable development in Viet Nam. The resolution calls for establishing an enabling environment for entrepreneurship through institutional reforms, improved market access, and investment incentives. Key priorities include advancing green and circular economy

business models, fostering innovation in clean energy and digital technologies, and implementing supportive mechanisms for private investment.

National Energy Development Strategy: Resolution No. 70-NQ/TW (August 2025) designates energy efficiency (EE) as one of the core pillars of the national energy strategy—aimed at ensuring stable, high-quality energy supply, reducing emissions, and protecting the environment. The resolution encourages investment in and the efficient use of energy, viewing this as both a right and a responsibility of society as a whole. It also promotes energy-saving technologies and equipment that are environmentally friendly.

Net-Zero Commitment: Viet Nam has pledged to reach net-zero greenhouse gas emissions by 2050, embedding this commitment in its COP26 implementation plan (Decision 888/QĐ-TTg, 2022), which mandates: aligning all strategic planning with decarbonization goals; deploying energy efficiency and green technologies—including clean fuels in transport and industry, green materials in construction, and incentives for energy-efficient buildings and appliances.

Just Energy Transition Partnership (JETP): The JETP, launched in December 2022, is a landmark international cooperation framework through which Viet Nam aims to achieve a cleaner, more inclusive energy transition while ensuring energy security and economic resilience. Energy efficiency is explicitly identified as one of the five key pillars of the JETP Action Plan, alongside renewables expansion, grid modernization, equitable labor transition, and green finance mobilization.

National Energy Master Plan 2021–2030 (Vision to 2050): Decision 363/QĐ-BCT (February 2026) Viet Nam’s National Energy Master Plan highlights EE as a core pillar of its strategic energy transition. It sets an ambitious target: achieve 8–10% EE savings by 2030, scaling to 15–20% by 2050, compared to a business-as-usual scenario⁴⁸.

Revised Power Development Plan VIII (2025): The plan places EE at the heart of its strategy to ensure energy security, reduce system costs, and support the country’s net-zero commitment. It promotes widespread adoption of energy-saving technologies across sectors, the implementation of demand-side management programs, and the integration of rooftop solar systems in 50% of public buildings and households by 2030. In the industrial and building sectors, the plan supports energy performance standards, ISO 50001 adoption, and smart energy management systems.

The National Green Growth Strategy: Prime Minister’s Decision No. 1658/QĐ-TTg (October 2021) emphasizes transitioning the growth model toward greening economic sectors, with a strong focus on energy efficiency. Energy efficiency is identified as a key pillar to decouple economic growth from energy consumption. By 2030, the Strategy

48 <https://chinhphu.vn/?pageid=27160&docid=208351>

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aims to reduce primary energy consumption per unit of GDP by 1.0% to 1.5% annually during the 2021–2030 period. By 2050, this reduction target is maintained at an average of 1.0% per year for each 10-year period⁴⁹.

National Energy Efficiency Program for the period of 2019-2030: Prime Minister’s Decision 280/QĐ-TTg (March 13, 2019) officially approves Viet Nam’s National Program for Energy Conservation and Efficiency during 2019–2030. Key targets include energy consumption reduction of 5–7% by 2025 and 8–10% by 2030⁵⁰. The program involves comprehensive measures—policy reform, financial and technical incentives, energy audits, adoption of high-efficiency technologies, and public awareness campaigns.

Key takeaway:

Viet Nam’s policy landscape is increasingly prioritizing energy efficiency while also opening the market to innovation-driven private sector participation. These efforts show a clear commitment to creating a more open and enabling environment for EE startups. As the demand for energy-saving technologies and services grows—driven by climate goals, digitalization, and resource efficiency—EE startups are well positioned to offer flexible and effective solutions.

3.2 EE Legal Framework: Turning Policy into Practice

Viet Nam’s legal framework on energy efficiency (EE) consists of two main groups:

- First, general laws and regulations governing the efficient and economical use of energy across multiple sectors, such as the Law on Economical and Efficient Use of Energy and the Law on Environmental Protection.
- Second, sector-specific regulations, including provisions on energy performance standards, mandatory energy audits, technical specifications, and related certification systems.

In conclusion, a thorough understanding of legal regulations enables Energy Efficiency Startups to develop Viet Nam’s legal framework on energy efficiency (EE) consists of two main groups: d solutions, leverage government support mechanisms, and confidently scale within the current legal framework.

This chapter provides an overview of Vietnam’s key policy orientations regarding Energy Efficiency, Innovation, and Innovative Entrepreneurship; introduces the EE legal and regulatory framework across major sectors; and analyzes how these regulations open up opportunities for startups.

⁵⁰ <https://chinhphu.vn/default.aspx?pageid=27160&docid=196453>

⁵¹ <https://chinhphu.vn/default.aspx?pageid=27160&docid=96051>

⁵² <https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Luat-Su-dung-nang-luong-tiet-kiem-va-hieu-qua-sua-doi-2025-so-77-2025-QH15-643029.aspx>

3.2.1 Key Laws and Regulation Governing Energy Efficiency and Innovation Start-ups Across Sectors

The Law on Economical and Efficient Use of Energy⁵¹ and its guiding decrees: The cornerstone of Viet Nam’s energy efficiency legal system is the Law on Economical and Efficient Use of Energy. This law provides the overarching legal framework to regulate, promote, and enforce energy-saving practices across all sectors of the economy. The amended Law on Economical and Efficient Use of Energy⁵² introduces additional provisions to guide enterprises in complying with energy efficiency requirements, while also establishing incentive mechanisms to encourage the adoption of energy-saving measures. Notably, the amended Law officially introduces the concept of “Energy Service Company (ESCO)” into legal documents. For startups, the law not only defines compliance pathways but also creates market demand for EE products, services, and innovations—especially in energy-intensive sectors like industry, transport, and construction.

Table 5: Legal Responsibilities on Energy Efficiency by Sector

Key Legal Obligations for Energy Users		Compliance & Oversight	Impact to EE Startups
Industry	- Develop and implement annual/5-year EE plans - Appoint certified energy managers - Conduct energy audits every 3 years - Replace outdated, inefficient equipment - Report EE performance to local authorities	- The Ministry of Industry and Trade (MOIT) issues EE standards and oversees compliance - Provincial Departments of Industry and Trade monitor designated energy users	- Creates steady demand for EE audit services, monitoring platforms, and advisory solutions - Opportunities for startups offering industrial process optimization, smart metering, and digital EMS (Energy Management Systems) - Enables entry into service contracts with factories and zones

51 <https://chinhphu.vn/default.aspx?pageid=27160&docid=96051>

52 <https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Luat-Su-dung-nang-luong-tiet-kiem-va-hieu-qua-sua-doi-2025-so-77-2025-QH15-643029.aspx>

Buildings	Apply EE standards in new design, construction, and renovation Use compliant lighting, HVAC, insulation, and control systems Public buildings must meet EE codes and MEPS Certain large buildings must report energy use	The Ministry of Construction develops technical regulations and standards for the sector Provincial Departments of Construction oversee permitting, supervision, and inspections	Market for smart building technologies, BMS (Building Management Systems), and IoT-enabled solutions Opportunities in green retrofit services and consultancy Access to public procurement in energy-efficient construction
Transport	Apply EE in transport planning and fleet management Use energy-efficient vehicles and fuels Adopt EE measures in transport infrastructure projects Compliance with EE standards for equipment and vehicle imports	The Ministry of Construction issues EE-related guidelines and strategies for the transport sector Provincial Departments of Construction monitor and supervise energy efficiency in transport operations	Opens niche for startups in clean mobility, route optimization software, and EV ecosystem services Potential in vehicle retrofitting, data-driven fleet solutions, and low-carbon logistics Collaboration with logistics firms and public agencies on pilot projects

Law on Environmental Protection⁵³ and its guiding decrees: Law on Environmental Protection (Law No. 72/2020/QH14) introduces several key provisions that directly relate to energy efficiency, greenhouse gas reduction, emission quota management, and green bond financing. To ensure effective implementation, the Government issued a series of guiding decrees, notably Decree No. 06/2022/ND-CP, which was further amended by Decree No. 119/2025/ND-CP issued on June 9, 2025. These provisions help translate national climate goals into binding regulatory obligations and market incentives—creating both compliance drivers and business opportunities for EE startups.

Investment Law and its guiding decrees: Investment Law (2020) and its guiding regulations provide a comprehensive set of incentives for businesses engaged in the production, application, and commercialization of EE technologies and services. For EE startups, understanding these investment incentives is essential for shaping financial models, improving returns, and accessing public support.

Science, Technology and Innovation Law (2025): This law provides a comprehensive legal framework that removes barriers, enhances research commercialization, and strengthens support for innovative enterprises. This law reflects the Government's

53 <https://thuvienphapluat.vn/van-ban/Tai-nguyen-Moi-truong/Luat-so-72-2020-QH14-Bao-ve-moi-truong-2020-431147.aspx>

commitment to promoting the startup ecosystem, facilitating technology transfer, and attracting high-quality human resources into the private innovation sector.

3.2.2 Industrial Sector: Key EE Regulations

Based on the Law on Economical and Efficient Use of Energy (2010) and the Law on Environmental Protection (2020), a wide range of regulations have been issued to guide and enforce EE implementation within the industrial sector. These regulations address key topics such as:

- **Energy consumption benchmarking by sub-sector** (e.g., steel, plastics, food processing);
- **Energy audits and planning obligations for designated energy users (DEUs);**
- **Mandatory GHG inventory and reporting** for industrial emitters;
- **Adoption of technical standards**, including national MEPS (TCVN) and international ISO norms;
- **Designation and compliance mechanisms** for large energy users under Prime Ministerial Decisions.

3.2.3 Building/Construction Sector: Key EE-Related Regulations

The Amended Construction Law (2020) introduces specific mandates to integrate energy-saving solutions in all phases of building development. The three core legal foundations include: Government Decree No. 06/2021/ND-CP, National Technical Regulation QCVN 09:2017/BXD, and the Ministry of Construction's regulations and technical standards focusing on energy efficiency in planning, design, construction, and operation.

3.2.4 Transport Sector: EE-Related Regulation

In addition to the Law on Economical and Efficient Use of Energy and the Law on Environmental Protection, the transport sector is increasingly governed by targeted regulations that promote energy efficiency, vehicle emissions control, and green mobility. The recently adopted Road Traffic Safety Law (effective 2025) and Decree No. 51/2025/ND-CP have reinforced Viet Nam's policy shift toward cleaner, energy-efficient transportation systems.

3.3 Legal Framework Enabling Start-up Development in Viet Nam

Viet Nam's startup ecosystem has received increasing attention from the government through a growing body of supportive laws, decrees, and strategic programs. EE startups benefit from these policies not only through general startup support mechanisms, but also through targeted incentives focusing on clean energy and green technologies. The table below summarizes key legal and policy instruments relevant to EE startups.

Table 6: Legal and Policy Instruments Supporting Startups in Viet Nam

Regulation	Main Content	Implications for EE Startups
Law No. 04/2017/QH14 – Law on Support for SMEs	Articles 17 & 18: Define support for innovative startups, including IP protection, R&D funding, incubation, and access to consulting and innovation networks.	Allows EE startups to benefit from national startup support schemes.
Law No. 61/2020/QH14 – Law on Investment	Appendix II: Lists energy efficiency as sectors eligible for special investment incentives.	EE startups gain access to tax reductions, land incentives, and simplified licensing.
Law No. 07/2017/QH14 – Law on Technology Transfer	Articles 33–35: Provides financial and procedural support for commercialization of technologies; includes incubation, consulting, and innovation support.	Encourage commercialization of EE technologies; supports tech transfer and adoption.
Decree No. 38/2018/NĐ-CP – Investment in Startups	Establishes legal framework for startup investment funds, angel investors, and venture capital; includes tax benefits and fund structures.	Expands financing options for EE startups through structured private investment mechanisms.
Decree No. 80/2021/NĐ-CP – Guidance on SME Support	Details implementation of the SME Support Law; defines procedures for accessing support services, innovation centers, and funding.	Practical gateway for EE startups to access incubators, labs, and state-supported financing.

Decree No. 94/2020/NĐ-CP – Incentives for NIC	Grants tax exemptions, land rent relief, and R&D support to businesses operating within National Innovation Centers.	EE startups located in NICs benefit from maximum regulatory and financial incentives.
Decree No. 55/2019/NĐ-CP – Legal Aid for SMEs	Establishes state support for legal consultation, IP, dispute resolution, and compliance assistance for SMEs.	Reduces regulatory burdens and ensures compliance pathways for EE startups.
Decree No. 76/2018/NĐ-CP – Tech Transfer & Incubation Support	Promotes establishment of startup incubators and support for applied research commercialization.	Enhances incubation and acceleration environment for EE solutions and products.
Directive No. 09/CT-TTg (2020) – Promotion of Startups	Calls on ministries and localities to support innovation through startup funds, R&D, and public procurement.	National-level support mandate opens opportunities for EE startups in public innovation programs.
Circular No. 06/2022/TT-BKHĐT	Provides detailed guidance on Decree 80; covers criteria and application process for SME startup support.	Clear implementation roadmap for EE startups to access state-funded programs.
Decision No. 569/QĐ-TTg (2022) – STI Strategy to 2030	Targets 40% of businesses engaging in innovation activities and doubling the number of innovative startups.	Includes EE startups within strategic focus on science and technology for green growth.
Resolution No. 98/2023/QH15 – Special Mechanisms for Ho Chi Minh City	Clause 14, Article 3: Grants authority to HCMC to pilot innovation policies, startup VC funds, sandbox regulations, and green procurement initiatives.	Offers localized advantages and fast-tracked mechanisms for EE and clean tech startups in HCMC.

3.4 What EE Startups Should Do

Based on the evolving policy and legal framework, EE startups should consider the following practical steps to position themselves for growth, compliance, and public-private collaboration:

Understanding policies

- Develop a clear understanding of the policy landscape and stay updated on legal instruments related to energy efficiency, climate action, and startup innovation, as early awareness is critical for strategic positioning.
- Focus on high-potential sectors—particularly industry, transport, and construction—where EE compliance is mandatory and demand for solutions is increasing.
- Leverage government incentives, including tax reductions, import duty exemptions, preferential loans, green bonds, and innovation-related support schemes to reduce financial barriers and support growth.

Product and solution strategy

- Align products and services with national strategies such as the National Green Growth Strategy, Power Development Plan VIII (PDP8), the Just Energy Transition Partnership (JETP), the National Energy Efficiency Program (VNEEP3), and the National Energy Master Plan to enhance relevance and access public funding.
- Design products and services with regulatory compliance in mind by integrating requirements related to labeling, certification, energy audits, reporting, and performance monitoring.
- Localize solutions to align with provincial EE action plans, smart city initiatives, and urban sustainability objectives in cities such as Hanoi, Ho Chi Minh City, and Da Nang.
- Highlight co-benefits such as greenhouse gas emission reductions, operational cost savings, and improved climate resilience to strengthen both commercial value and social impact.

Networking and resource mobilization

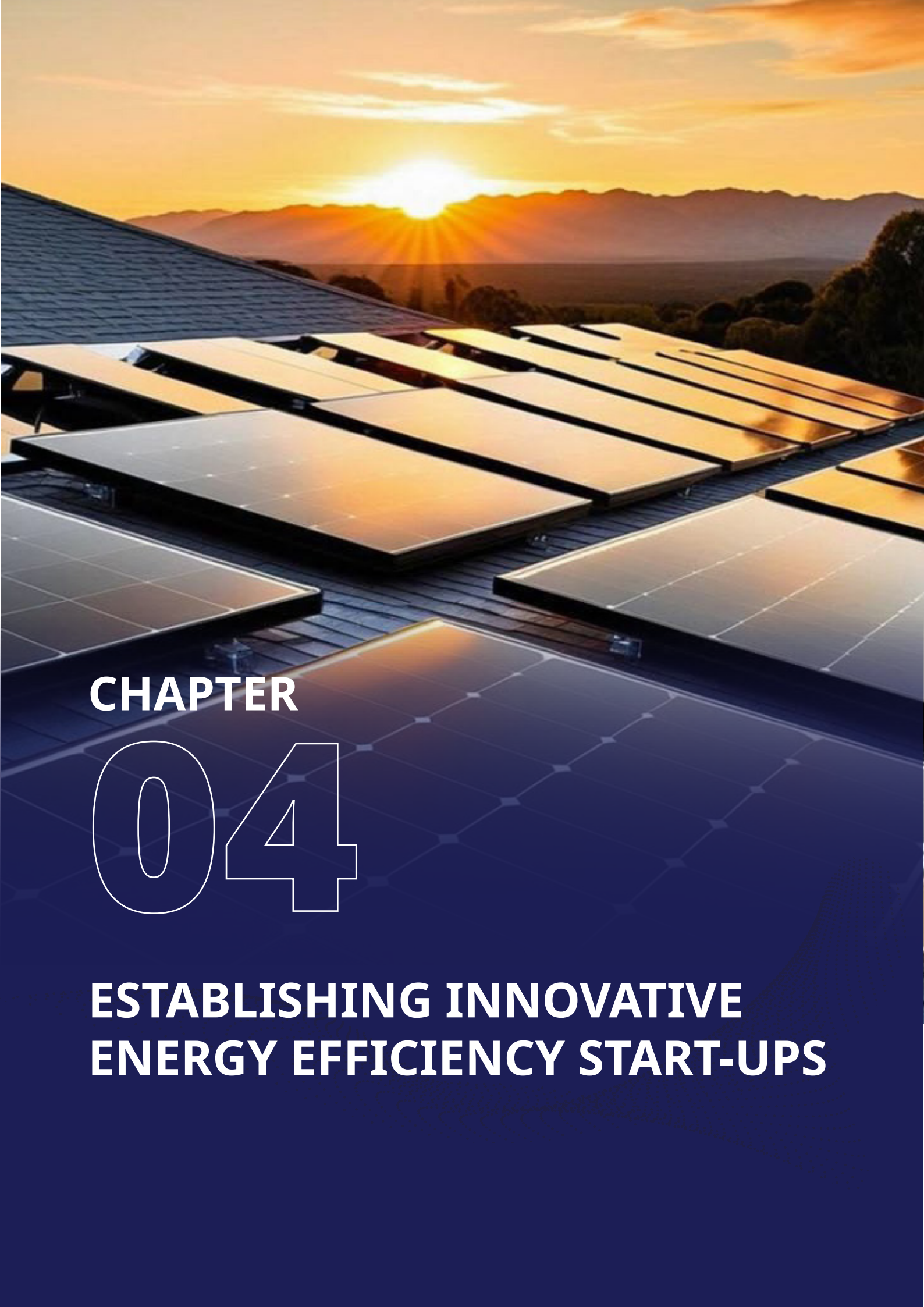
- Participate in innovation programs organized by national and local institutions, such as the National Innovation Center (NIC), startup incubators, and policy pilot programs, to test, refine, and scale EE solutions.
- Build strong partnerships with key stakeholders, including designated energy users, EPC contractors, local authorities, and industry associations, to access projects, financing, and deployment channels.
- Maintain visibility through official government portals, startup and trade associations, and multilateral networks focused on green innovation and sustainable entrepreneurship.

3.5 Additional Resources: Legal and Policy Impacts on EE Startups

A set of online resources has been compiled. These resources provide access to key laws, decrees, and technical standards, along with practical tools to evaluate their implications for EE startups across industry, buildings, and transport.

- Resource #1 – Law on Environmental Protection (LEP) and Impact to EE startups
- Resource #2 – Investment Law Incentives and Impact to EE startups
- Resource #3 – STI Law 2025 and Impact to EE startups
- Resource #4 – Industrial EE Regulations and Impact to EE. startups
- Resource #5 – Building EE Regulations and Impact to EE startups
- Resource #6 – Transport EE Regulations and Impact to EE startups

The full set of assessment can be accessed by scanning the QR code below.



CHAPTER

04

**ESTABLISHING INNOVATIVE
ENERGY EFFICIENCY START-UPS**



CHAPTER 4. ESTABLISHING INNOVATIVE ENERGY EFFICIENCY START-UPS

This chapter outlines a practical roadmap for launching and scaling EE start-ups in Viet Nam. It draws on globally recognized frameworks—Design Thinking and the Lean Startup methodology — adapted to the unique challenges and opportunities of the Vietnamese EE market. Structured across six key stages—from ideation to scale-up—the chapter provides localized tools, guidance, and case studies to help entrepreneurs build ventures that are not only commercially viable but also aligned with Viet Nam’s energy and climate goals.

1. Ideation Identifying problems and opportunities in the energy landscape.	2. Validation Engaging stakeholders to validate pain points and value.
3. Business Model Developing a sustainable and scalable business model.	4. Prototyping Designing and testing a Minimum Viable Product.
5. Launch Establishing operations and go-to-market strategies.	6. Scale-Up Expanding customer base and entering new markets.

Figure 6: Building an Innovative Energy Efficiency Startup in Viet Nam

Each stage of the roadmap will be accompanied by key guiding questions, step-by-step instructions, and illustrative case studies to support entrepreneurs in transforming their ideas into practical, impact-driven energy efficiency (EE) startups. This approach not only enhances the success rate of new ventures but also ensures that startups are aligned with Viet Nam’s national energy and climate goals.

54 Design Thinking is a human-centered innovation methodology that focuses on understanding user needs, testing, and iterating solutions.

55 Lean Startup is a business and product development methodology focused on optimizing flexibility and efficiency by rapidly building and deploying products. This approach helps shorten product development cycles and quickly validate the business model’s viability, thereby delivering value to customers as early as possible.

4.1 Stage 1 - Ideation: Finding and Framing the Right Problem

Every successful venture begins not with a solution, but with a deep understanding of a problem worth solving. In the EE sector, this means moving beyond the general goal of “saving energy” to identify specific, acute pain points within the Vietnamese market. This initial stage is the foundation upon which your entire business will be built; a weak foundation will inevitably lead to a shaky enterprise. The goal of ideation is to emerge with a clearly defined problem, a novel solution concept, and a set of core assumptions to be tested.

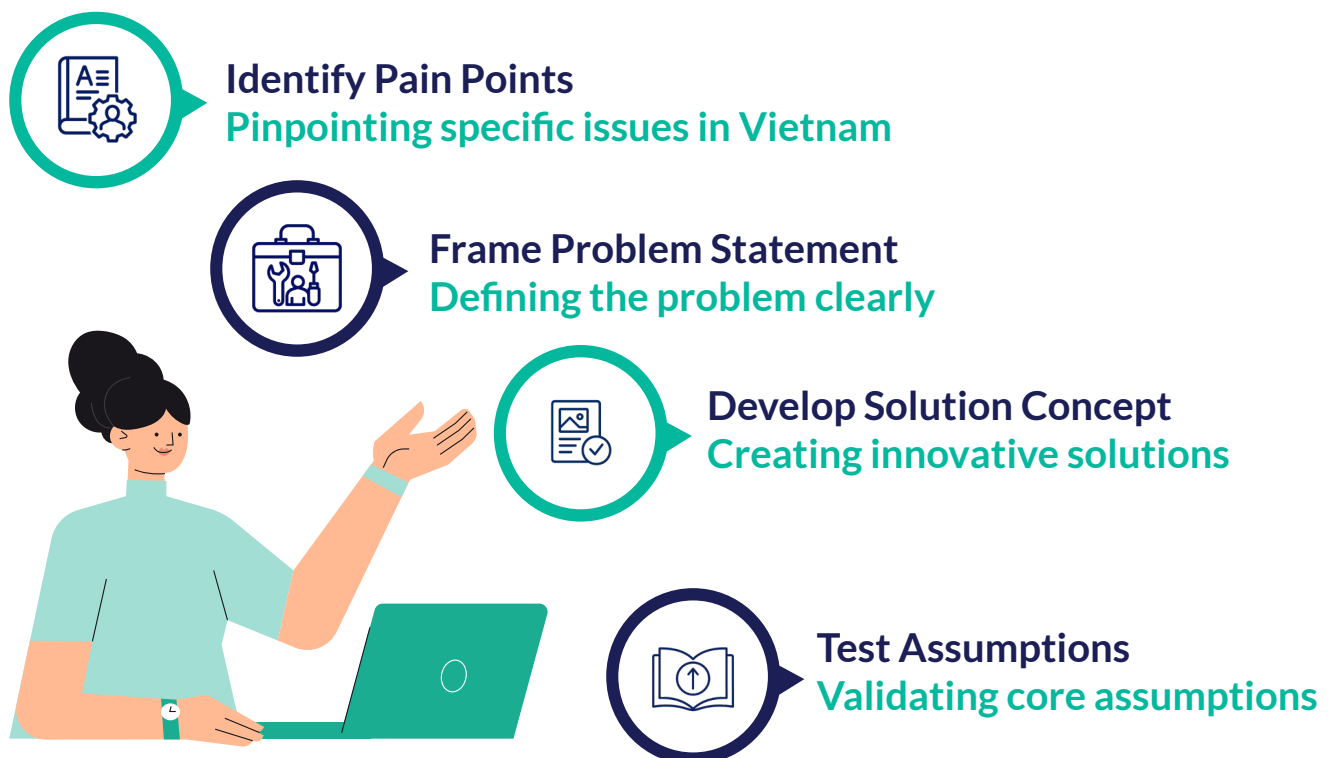


Figure 7: Idea to Solution Framework

4.1.1 Defining a Tangible Energy Efficiency Problem in Viet Nam

The first step for any entrepreneur in the energy efficiency (EE) sector is to identify a specific, measurable, and practical problem. Viet Nam’s rapid economic growth, coupled with rising energy demand, creates numerous opportunities in this field. The task of a startup is to pinpoint a niche market within these broader macro trends—where it can deliver a targeted and effective solution.

Accurately defining a concrete and impactful problem within these areas forms the foundation for developing an innovative and commercially viable solution.

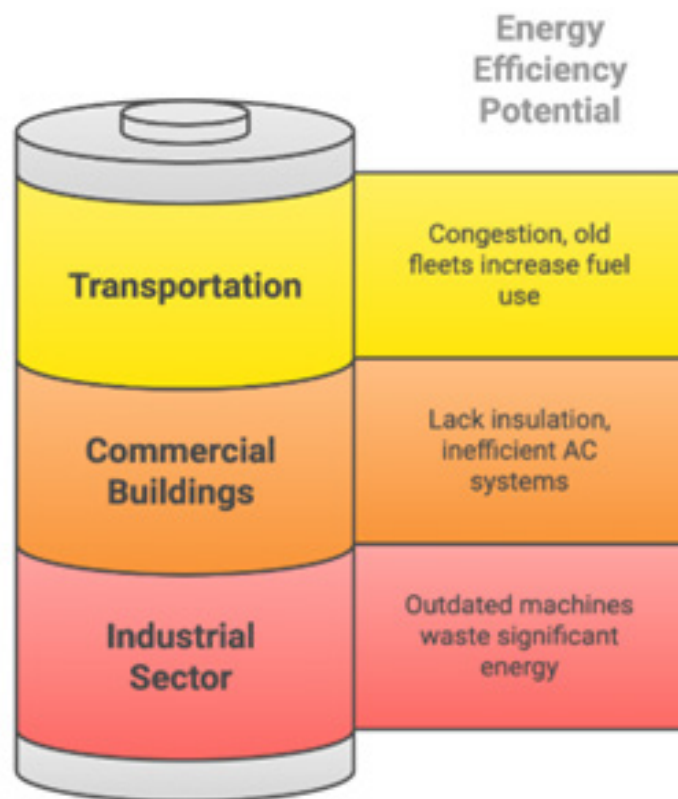


Figure 8: Energy efficiency opportunities across sectors

To move from sectoral insights to a viable startup concept, founders must translate observations into a clear and focused problem statement. This should outline:

- Context: Where and when the problem occurs.
- Customer: Who is affected—be specific (e.g., “factory floor managers” instead of just “factories”).
- Root cause: What is driving the inefficiency or energy waste?
- Impact: What are the tangible (e.g., excess energy bills, downtime) and emotional (e.g., frustration, uncertainty) consequences? For example, “wasted 300 million dong per year on excess electricity” “frustration over unreliable equipment”

A vague statement like “factories waste energy” lacks focus. A sharper version might be: “Vietnamese seafood processing plants lose 30% of electricity through inefficient freezing systems, increasing costs and reducing export competitiveness.” This identifies a target segment, quantifies the issue, and suggests a potential value proposition.

By clearly framing such a problem, you create a strong foundation for ideation, validation, and product development in later phases of your startup journey.

4.1.2 Generating and Testing Innovative Solutions

Once a tangible energy efficiency problem has been defined, the next step is to generate creative and practical solution ideas. This phase encourages divergent thinking—exploring a broad range of possibilities—before converging on the most promising direction. A structured approach like Design Thinking helps teams stay focused on real user needs, not just technology.

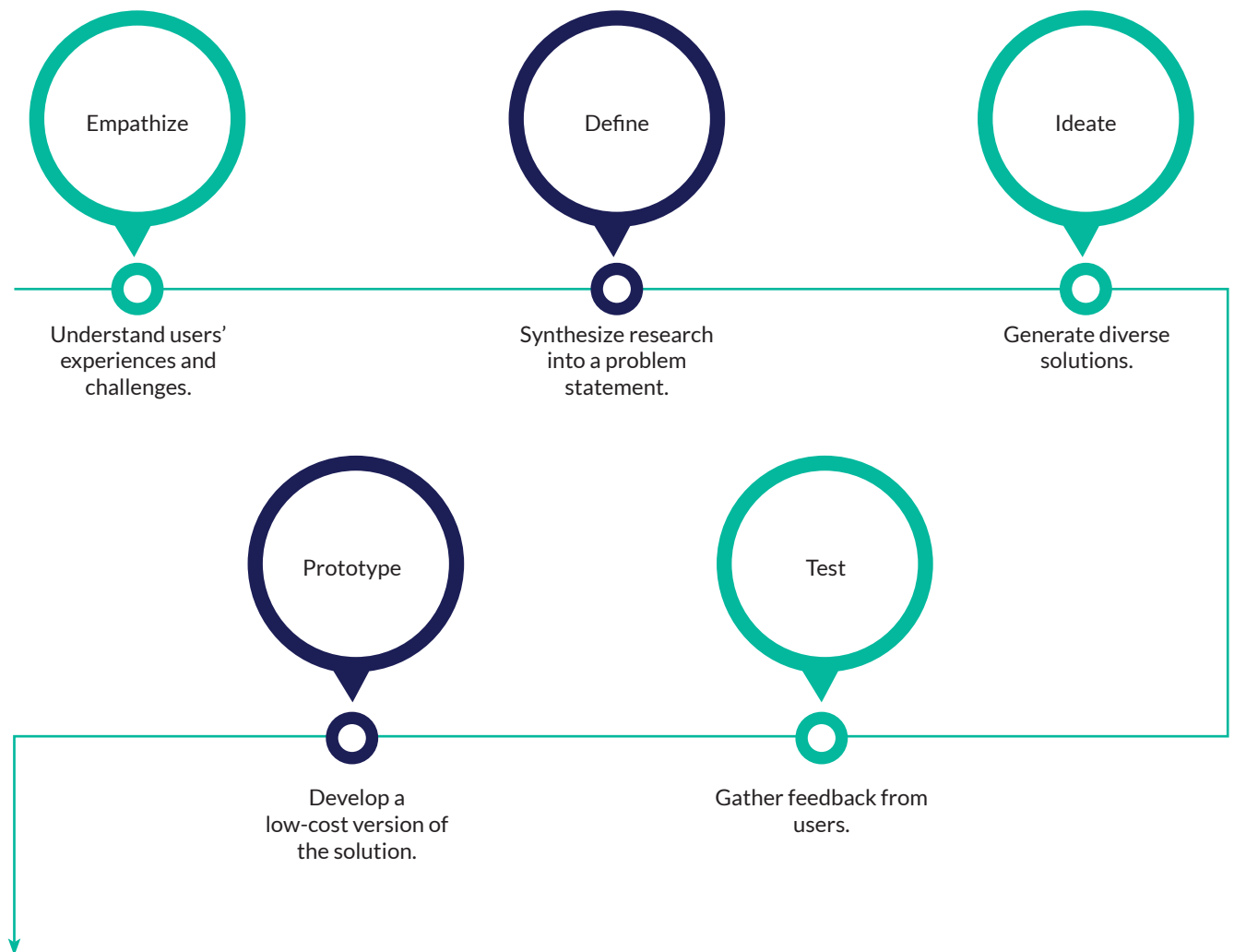


Figure 9: The Design Thinking Process: From Empathy to Testing

Design Thinking: A User-Centric Approach: Design Thinking is a powerful innovation framework that places human users at the center. It is especially useful in energy efficiency, where success often depends on changing behaviors and adapting to existing operational workflows.

The five stages of Design Thinking are explained below, each with actionable guidance for EE entrepreneurs in Viet Nam:

Table 7: Five phase of Design Thinking

Step 1. Empathize: Understand the User's World

This stage is about immersing yourself in the daily realities of your target customers. Go beyond desktop research—observe, listen, and learn in the field.

- **Action steps:**
 - Conduct site visits to factories, office buildings, or transport hubs.
 - Interview different stakeholders (e.g., factory managers, maintenance engineers, hotel operators).
 - Ask open-ended questions: “What frustrates you most about your energy bills?” or “What prevents you from upgrading your equipment?”
- **Tip:** Look for emotional cues. A plant manager might express fear about downtime, even if the owner wants energy savings.

Step 2. Define: Frame the Right Problem

After gathering raw insights, synthesize them into a clear, actionable **problem statement** that captures the user's needs and context.

- **Components of a good problem statement:**
 - Who is facing the problem?
 - What are they trying to achieve?
 - What's blocking them?
 - Why does it matter?
- **Example:** “Mid-size textile factories in Binh Duong struggle to control steam system losses, causing ₫200 million/year in excess fuel costs and making them less price-competitive.”

Step 3. Ideate: Explore a Wide Range of Ideas

Now shift into creative mode. The goal is **quantity**, not immediate feasibility.

- **Techniques to try:**
 - Brainstorming sessions with engineers, energy managers, and business designers.
 - Mind Mapping to explore adjacent ideas.
 - Use “How Might We...?” prompts to reframe challenges (e.g., “How might we monitor boiler efficiency in real-time without expensive sensors?”).
- **Example outputs:**
 - A mobile app for factory-floor energy alerts.
 - A service model for energy audits bundled with financing.
 - A cooling retrofit solution using local materials.

Step 4. Prototype: Make It Tangible

Bring your ideas to life quickly and cheaply. A prototype is not a final product—it's a way to **visualize, communicate, and test**.

- **Forms of prototypes:**
 - Paper sketches of a software dashboard.
 - A cardboard mock-up of a smart plug.
 - A video walkthrough of how a building retrofit service would work
- **Goal:** Reduce abstraction. Help users imagine how your solution fits into their operations.

Step 5. Test: Get Feedback, Iterate, Improve

Show your prototype to real users. Capture both what they **say** and how they **behave**.

- **Questions to ask:**
 - “Is this easy to understand?”
 - “Would you use this? Why or why not?”
 - “What would make you trust this solution?”
- **Refine your idea** based on this input. You may discover that your pricing model needs to change—or that a low-tech version is more attractive.

By using design thinking tools and putting users at the center, EE startups in Viet Nam can discover not just functional solutions but also desirable, feasible, and viable ones that fit the local context. This serves as the foundation for creating scalable energy-efficient products and business models that generate sustainable impact.

Case Example: Applying Design Thinking in Practice

Consider the case of a startup founder in Ho Chi Minh City who observed that many small-scale commercial bakeries still rely on outdated, energy-intensive electric ovens. This obsolete equipment not only drives up electricity bills but also results in inconsistent baking quality, negatively impacting customer experience and the business's competitiveness.

Table 8: Example of Applying Design Thinking in Practice

Empathize

The founder conducted field visits to five bakeries, closely observing daily operations and speaking with owners. She discovered that beyond the electricity costs, the real pain points included unreliable baking performance and production downtime from oven malfunctions.

Define

The founder framed the problem as follows: “Small commercial bakery owners in HCMC face high, unpredictable energy costs and revenue loss due to inefficient and unreliable ovens, making it difficult to maintain cash flow and product consistency.

Ideate

Using “How Might We” questions, the founder explored ideas such as:

- How might we make efficient ovens more accessible to small bakeries?
- How might we reduce the risk and cost of oven maintenance?
- How might we ensure perfect baking results regardless of operator skill?

The brainstorm led to a service-based model rather than a one-time product sale.

Prototype

The founder created a simple brochure to test a “Bakery-as-a-Service” concept—offering energy-efficient ovens bundled with maintenance, remote monitoring, and a performance guarantee, all for a flat monthly fee

Test

Bakery owners reacted positively to the prototype. They appreciated the predictability of monthly costs and the elimination of surprise repair expenses. Their feedback validated the business model and helped refine service features before full-scale development.

This example illustrates how a founder can move from field insights to a viable energy efficiency business model using structured Design Thinking steps. It also demonstrates the power of understanding customer behavior—not just technology—in crafting relevant and scalable EE solutions in Viet Nam.

Founder Tip – Turning Insights into Opportunity

The most successful EE startups don't start with a technology—they start with a real, specific pain point. Spend time on the ground, listening deeply to the people affected. Quantify the problem in their language (like fuel bills or machine downtime), not just in kilowatt-hours. Then, when ideating solutions, resist the urge to over-engineer—build small, test fast, and iterate with users who will eventually pay. In Vietnam's fast-changing energy landscape, the winners will be those who frame the right problem, design around real-world constraints, and stay relentlessly focused on user value.

4.2 Stage 2 - Validation: Proving Your Idea Has a Market

Once you've identified a clear energy efficiency problem and brainstormed potential solutions, the next phase is Validation—ensuring that real customers in Viet Nam truly face this problem and are willing to pay for your proposed solution. This stage is about collecting evidence, not assumptions.

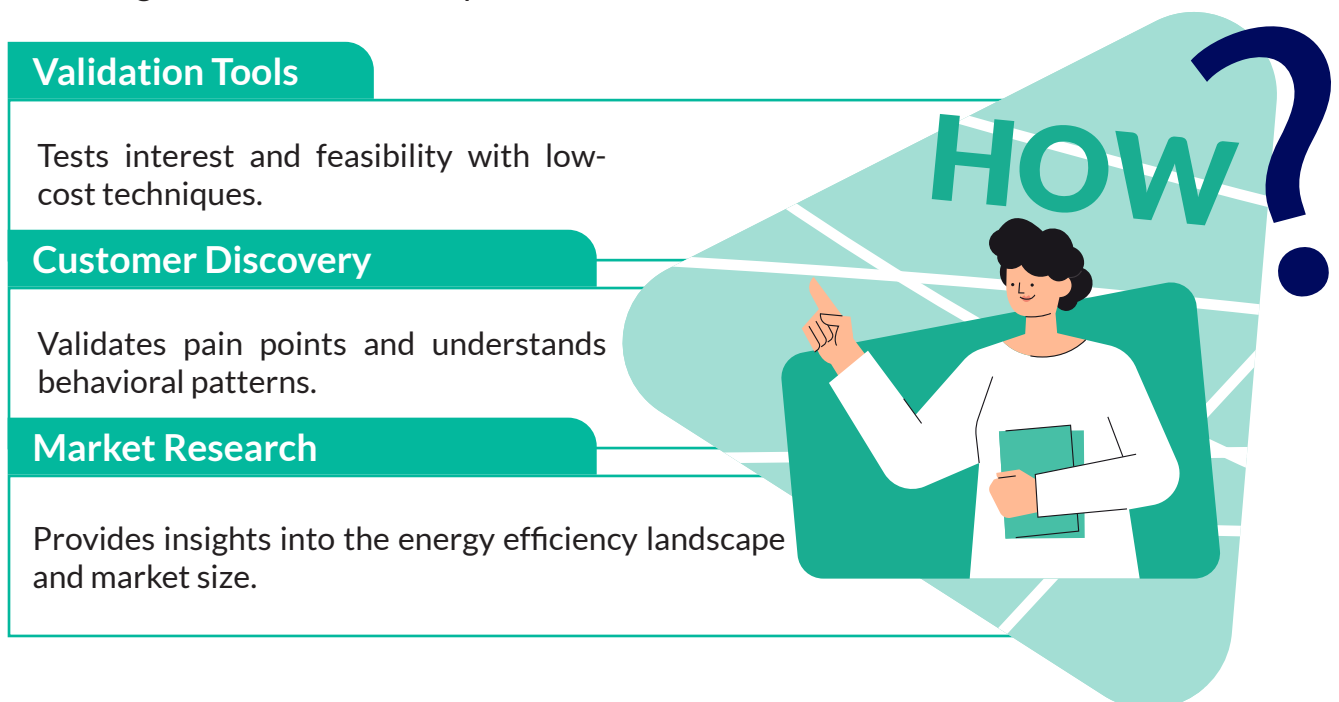


Figure 10: How to validate the problem and market in Viet Nam?

By the end of this stage, your goal is to confidently answer: “Do real customers in Viet Nam care about this problem, and are they eager for our proposed solution?” If the answer is backed by hard evidence—interview notes, survey data, or actual user sign-ups—you’re ready to move forward to building your business model.

4.2.1 Market Research: Sizing the Opportunity and Understanding the Landscape

Validation begins with structured market research to understand the broader context. This involves a combination of gathering existing data (secondary research) and generating your own insights (primary research).

Secondary Research: Leveraging Existing Knowledge Before engaging directly with customers, equip yourself with macro-level insights from public and expert sources. These help you scope the size of your opportunity, recognize national policy priorities, and prepare for deeper field research. In Viet Nam, useful sources include:

- **Government Reports and Plans:** Ministries like MOIT and MOC provide data through plans such as the National Energy Master Plan, Power Development Plan VIII, and VNEEP3. These documents highlight government priorities, investment directions, and policy-driven market gaps.
- **International Agency Reports:** Reports from IEA, World Bank, UNDP, and ADB often contain sectoral data, case studies, and benchmarks for Viet Nam, especially around industrial energy use, buildings, and grid efficiency.
- **Academic and Trade Publications:** Local universities and industry associations frequently publish insights on specific sectors like textiles, logistics, or construction, helping identify energy inefficiencies and technical challenges.

This step helps estimate your Total Addressable Market (TAM). For example, if you’re targeting inefficient motors in textiles, quantify how many such factories exist, how much energy is consumed in motor operations, and what level of savings your solution could achieve.

Primary Research: Mapping the Competitive and Practical Landscape Secondary research gives you context, but only direct engagement reveals what’s already happening on the ground:

- **Direct Competitors:** Are there startups or companies already solving this problem in Viet Nam? What’s their pricing, model, and customer feedback?
- **Indirect Competitors:** What other products or services achieve similar outcomes (e.g., high-efficiency ACs vs. smart cooling control)?
- **Customer Workarounds:** How are customers coping without a commercial solution? If they are opening windows instead of upgrading ACs, or using manual schedules to manage machine loads, this confirms both the pain and the opportunity.

Ultimately, your goal is not to be the first or only option—but the best-suited solution for the Viet Namese context: better localized, easier to deploy, or more affordable for your target customer.

4.2.2 Customer Discovery: The Heart of Validation in Viet Nam

While secondary research helps you frame hypotheses, real insights emerge from direct, in-person conversations. This process—called customer discovery—is the most critical component of the validation stage. It’s not about pitching your idea, but listening, observing, and learning from your target users.

The Lean Startup Principle: “Get Out of the Building” Popularized by Eric Ries, this principle encourages founders to step outside their assumptions and into the real world. In Viet Nam, where trust and relationships often outweigh formal surveys, face-to-face interactions—whether in offices, coffee shops, or factory floors—can unlock powerful insights.



Identify Target Segments

Define decision-makers, users, and influencers to focus interview efforts.

Find Interviewees

Utilize networks and platforms to connect with potential customers.

Conduct Interview

Structure questions to explore daily operations and challenges.

Introduce Solution Last

Share your idea after understanding customer needs.

Figure 11: How to Conduct Effective Customer Discovery Interviews in Viet Nam

How to Conduct Effective Customer Discovery Interviews:

1. Define Your Target Personas:

Break down the key stakeholders relevant to your idea. Think beyond just one “customer”—energy efficiency solutions usually involve multiple roles:

- Economic Buyer – Who makes the purchasing decision? (e.g., Factory Owner, School Director)
- End-User – Who directly uses the solution? (e.g., Facility Manager, Maintenance Staff)
- Influencer/Technical Gatekeeper – Who provides input or approval? (e.g., Energy Consultant, Procurement Officer)

2. Find the Right People to Interview:

Leverage existing networks and local relationship dynamics:

- Use referrals from trusted partners (e.g., startup mentors, business advisors).
- Engage industry associations (e.g., VCCI, VEA, sector-specific trade groups).
- Connect via LinkedIn, alumni communities, and innovation hubs (e.g., NIC, SIHUB, Bach Khoa Incubator).
- Attend local events and trade fairs relevant to energy and industry.

Tip: Personal introductions work better than cold calls in Viet Nam. Ask your connections to “open the door” for you.

3. Structure the Conversation – But Stay Flexible:

Your goal is insight, not confirmation. Use the flow below:

		Purpose
Interview Phase	Questions to Ask	
Start Broad	“Can you walk me through a typical day in your role?”	Build rapport and understand context
Explore the Problem	“How do you manage electricity use? Any major challenges?”	Identify pain points
Understand Behavior	“Have you tried to fix that issue before? What did you try? What happened?”	Learn real behaviors—not hypothetical ideas

● 3. Structure the Conversation – But Stay Flexible:

Your goal is insight, not confirmation. Use the flow below:

Interview Phase	Questions to Ask	Purpose
Quantify the Impact	“What are the costs if this issue isn’t fixed? Downtime? Bills? Staff time?”	Validate the size and urgency of the problem
Emotional Insights	“What frustrates you the most about this situation?”	Tap into emotional drivers
Ask About Solutions	“What would an ideal solution look like to you?”	Discover their expectations/preferences

Tip: Let them talk more than you. Listen 80%, speak 20%.

● 4. Introduce Your Idea (Only at the End):

Once you’ve thoroughly explored their reality, share a brief, no-pitch summary: *“Based on what you said, we’re testing a solution to help reduce peak-hour AC bills for small hotels using smart sensors and usage analytics. Would something like that interest you?”*

Then ask:

- “What’s your first impression?”
- “What would make this more useful for you?”
- “What might prevent you from using it?”

Tip:

- Warm up the conversation before jumping into business—ask about their background, business history, etc.
- Face-to-face (or at least video) is ideal; Viet Nameese business culture values personal interaction.
- Be respectful of hierarchy—sometimes you’ll need to go through an assistant or technical lead before reaching the decision-maker.
- Be patient and polite—some may need more time to open up, especially on sensitive topics like inefficiencies or costs.

Case Study: Customer Discovery for a Smart Building Solution

A startup planned to develop a sophisticated AI-powered system to optimize air conditioning in large commercial buildings in Ho Chi Minh City. Their initial assumption was that building owners were eager for cutting-edge technology to reduce costs.

- **The Interviews:** They secured interviews with five building managers and two property owners.
- **The Insight:** They quickly learned that while owners were interested in cost savings, the building managers—the actual users—have concerns about a complex new system they could not override. Their primary goal was to avoid tenant complaints about being too hot or too cold. Any “smart” system that took control away from them was seen as a threat, not a help.
- **The Pivot:** Based on this feedback, the startup redesigned their solution. Instead of a fully autonomous “black box” system, they created a simpler interface that provided strong recommendations and alerts but always left the final control in the hands of the building manager. They reframed their value proposition from “AI-powered cost reduction” to “A smart assistant to help you reduce costs while keeping tenants happy.” This user-centric pivot, born directly from customer discovery, dramatically increased the solution’s market acceptability.

4.2.3 Validation Tools to Gather Evidence

To complement your qualitative interviews, EE startups should also deploy structured tools to quantify interest and confirm assumptions. These validation tools can help uncover real market signals—beyond anecdotes and opinions.

● Surveys

Surveys are an efficient way to gather quantitative data at scale. This works especially well for B2C or SME-focused solutions. Example:

- A survey of 100 small restaurant owners may reveal that 70% rank electricity costs among their top three business concerns.

Tips: Keep surveys short, mobile-friendly, and clearly state the purpose. Consider partnering with industry groups or startup networks to improve response rates.

● Landing Page Test

This method allows you to test demand before building your solution:

- Create a simple website explaining your value proposition and a clear call to action (“Sign up for early access,” “Request demo”).
- Run small ad campaigns (e.g., Facebook or Zalo) targeting your customer segment.
- Measure conversion rates. High engagement = strong signal of interest.

● Prototypes and Mock-Ups

Build a visual or physical representation of your solution:

- It can be as simple as a clickable dashboard, infographic, or cardboard mock-up.
- When shown to potential users, prototypes elicit more specific feedback than abstract concepts.

Key Note: Visuals are particularly helpful in overcoming technical communication barriers and in engaging non-expert stakeholders (e.g., building managers, small business owners).

Throughout the validation stage, think like a detective, not a salesperson. Collect interview notes, survey stats, and engagement metrics to move from assumptions to facts. By the end of this phase, you should be able to say something like:

“We interviewed 20 building managers and surveyed 50 small businesses. 80% confirmed energy costs as a priority, and 15 expressed willingness to pilot our service.”

That evidence gives you the confidence—and credibility—to move on to building your business model.

Founder Tip – Validate with Humility, Not Assumptions

Don't fall into the trap of building in isolation. Even the best ideas fail if they solve a problem no one truly cares about—or if the solution doesn't fit the user's context. Validation is not about proving you're right; it's about learning what's real. In Vietnam, trust is built face-to-face—so get out of your comfort zone, visit factories, sit with shop owners, walk through buildings. Listen more than you speak. If users don't understand or want your solution, the answer isn't to "educate" them—it's to adapt. Strong startups evolve not just through data, but through empathy and local insight.

4.3 Stage 3 - Business Model Development: Architecting a Viable Enterprise

With a validated problem and promising solution in hand, the next critical step is designing a business model—your blueprint for how to create, deliver, and capture value in a way that is viable, scalable, and aligned with Viet Nam's local context.

In the energy efficiency (EE) sector, where returns may take time and customers are sensitive to upfront costs, a well-crafted business model is not optional—it is vital to your survival and growth.

4.3.1. Why Business Models Matter in Energy Efficiency

In the energy efficiency (EE) sector, a good idea or even a breakthrough technology is not enough. Many startups fail not because of poor solutions—but because they lack a viable way to bring those solutions to market and get paid for them. That's why building a robust business model is essential.

A business model is far more than a simple plan to generate revenue. It is a systematic blueprint that connects your solution to your customers through a repeatable, scalable, and financially sustainable mechanism. For EE startups in Viet Nam, a well-designed business model serves four critical functions:

● 1. De-risking the Venture

The business model acts as a testable hypothesis. By mapping out your key assumptions—such as your pricing model, customer acquisition strategy, and delivery process—you identify where the biggest risks lie.

Key questions to address:

- How will you reach your first 10 customers?
- What are the major cost drivers?
- What capabilities or partnerships are mission-critical?
- What happens if customers delay payment or need custom adaptations

Tip: Use the business model as a living document that evolves with your learnings. Refine it constantly based on customer interviews, pilot deployments, and early financial results.

● 2. Overcoming Customer Barriers

One of the biggest challenges for EE adoption in Viet Nam is high upfront cost. While clients may be convinced of the long-term savings, they often lack the budget flexibility to invest today—especially small factories, hotels, or schools. To address this, your business model must include innovative financing mechanisms that shift CapEx (capital expenditure) to OpEx (operating expenditure), making adoption easier.

Examples:

- **Leasing model:** Customer rents the equipment with service included.
- **Subscription model:** Pay a fixed monthly fee for continuous monitoring and optimization.
- **Shared savings model:** Your revenue comes as a percentage of verified savings.

These models reduce friction and make your offer more attractive and accessible to price-sensitive clients.

3. Communicating Value to Stakeholders

Your business model is also a powerful communication tool. It helps investors, partners, and employees understand how your startup will survive, scale, and succeed:

- **For investors:** It shows that you understand your market and have a credible path to profitability.
- **For strategic partners:** It highlights opportunities to collaborate (e.g., hardware vendors, financial institutions).
- **For employees or co-founders:** It creates alignment on the company's direction and operating logic.

***Tip:** Use the Business Model Canvas or Lean Canvas (see next section) to present your model in a concise and compelling format during pitches or partner meetings.*

4. Aligning with the Viet Nameese Market Context

A business model that works well in Europe or North America may not automatically succeed in Viet Nam. You must adapt to local realities:

- **Longer B2B sales cycles:** Decisions often require approval from multiple layers of management or state-owned companies.
- **High value on personal relationships:** Direct contact, local partners, and trust-building are essential.
- **Desire for tangible, guaranteed results:** Abstract benefits are less persuasive than quantifiable savings.
- **Policy-driven markets:** EE purchasing decisions may be influenced by Viet Nam's national energy goals, VNEEP incentives, or ESG reporting requirements.

***Tip:** Adaptation Strategies*

- *Offer pilot programs or trial periods to reduce customer risk.*
- *Build partnerships with local implementation firms or ESCOs.*
- *Design your model to integrate with existing government or donor programs*

Summary: A robust business model is not just a financial plan—it is the strategic engine that ensures your startup can turn impact into income. It helps you navigate uncertainty, build trust with customers, and align with Viet Nam’s unique market dynamics. Start simple, iterate fast, and always stay grounded in the realities of your target users and buyers.

4.3.2 Tools to Design Your Business Model: BMC vs. Lean Canvas

Once you have validated that a real problem exists and that customers in Viet Nam are willing to explore solutions, the next step is to translate those insights into a structured, scalable business model. Two widely recognized frameworks can help you systematically design, communicate, and iterate your business model: the Business Model Canvas (BMC) and the Lean Canvas.

The Business Model Canvas (BMC): Developed by Alexander Osterwalder, the BMC provides a comprehensive view of how a business creates, delivers, and captures value. It is particularly useful for EE startups in Viet Nam that must often deal with multi-stakeholder sales, long payback periods, and complex technical offerings. The canvas consists of nine interconnected building blocks:

Table 9: Business Model Canvas

Block	Guiding Questions	Component Description	Specific Example
Customer Segments	Who are your most important users and buyers?	The target customer groups the business serves.	Mid-sized textile factories in Binh Duong and Dong Nai; commercial building owners in Hanoi’s old quarter.
Value Propositions	What value do you deliver? Which pain points are you solving?	The unique value and compelling value promise the business delivers.	“We reduce AC electricity bills by 20% using smart sensors, without requiring any system replacement.”
Channels	How do you reach your customers?	Communication, distribution, and sales channels.	Technical sales team, industry expos (e.g., Entech Viet Nam), partnerships with local energy service companies (ESCOs).
Customer Relationships	What kind of relationship do your customers expect?	The types of relationships between the business and customers (automated, personal, communities, etc.).	Onboarding audits, regular performance reviews, dedicated account support.

Block	Guiding Questions	Component Description	Specific Example
Revenue Streams	How do you earn revenue? What are your pricing strategies?	Revenue sources generated from each customer segment.	Monthly subscription with a tiered model, plus a bonus for verified energy savings above 15%.
Key Activities	What core activities must you perform to deliver value?	Key activities required to create value.	Energy audits, sensor deployment, software development, client training.
Key Partners	Who are your critical external collaborators?	Strategic partners that support operations.	EVN for metering data, sensor vendors from Korea or Germany, local engineering contractors for installations.
Cost Structure	What are the major costs?	All fixed and variable costs.	Staff salaries, hardware procurement, system maintenance, marketing, travel for site visits.

The Lean Canvas: Created by Ash Maurya in 2010, the Lean Canvas modifies the BMC to better suit early-stage startups—those still testing ideas, rather than scaling businesses.

Table 10: Lean Canvas Model

Component	Guiding Questions	Component Description	Specific Example
Problem	What key problems are customers facing?	Identify the pain points or difficulties of the target customers that the product/service aims to solve	Factories are consuming high amounts of electricity, facing high costs, and their systems fail to optimize energy consumption.
Customer Segments	Who are the target customers? Which group do they belong to?	Identify groups of users or organizations with shared needs and problems.	Industrial factories or large office buildings wanting to reduce energy costs and improve efficiency.

Component	Guiding Questions	Component Description	Specific Example
Solution	What is the specific solution for each problem?	Describe how the product or service solves the top three customer problems.	IoT platform + data analytics software to monitor and optimize energy consumption in real-time.
Unique Value Proposition	Why should customers choose you?	The differentiation and specific value the Startup brings to customers.	"Reduce energy bills by up to 20% in 6 months with a comprehensive monitoring and optimization solution."
Channels	How to reach customers?	Marketing, sales, and communication channels to reach and attract customers.	Industry workshops, EPC (Engineering-Procurement-Construction) networks, partnerships with business associations.
Revenue Streams	How does the Startup make money?	Identify revenue sources from customers.	Initial deployment fee + monthly service fee based on generated energy savings (shared savings model).
Cost Structure	What are the major costs in this model?	List the necessary costs to operate and develop the product.	IoT software costs, on-site sensor installation, data analysis personnel costs, maintenance costs.
Key Metrics	Which metrics reflect growth and success?	Measure operational efficiency and progress toward goals.	Energy saving rate (kWh reduced), number of new customers per quarter, customer retention rate.
Unfair Advantage	What makes you hard to copy?	Proprietary, hard-to-imitate factors that competitors cannot easily acquire.	Rich industry data network, analysis algorithms based on years of customer experience, exclusive partnerships with major sensor suppliers.

Comparison Between the Lean Canvas Model and the Business Model Canvas:

Component	Business Model Canvas (BMC)	Lean Canvas (LC)	Similarity / Difference
Customer Segments	Defines the target customer groups that the business serves.	Focuses more on early adopters.	Similar in purpose, but LC narrows the focus to early-stage users.
Value Proposition	The value the business delivers to meet customer needs.	Focuses on the unique value proposition (UVP) and the most compelling "value promise."	Similar in essence; LC emphasizes differentiation and experimentation.
Channels	Communication, distribution, and sales channels.	Same as BMC.	Identical component in both models.
Customer Relationships	Types of relationships with customers (automated, personal, community-based, etc.).	Not included in LC.	LC omits this component because early-stage startups rarely need to define customer relationships in detail.
Revenue Streams	Sources of revenue from each customer segment.	Same as BMC.	Identical in both models.
Key Activities	The main activities required to deliver value.	Replaced by Problem & Solution.	LC specifies concrete problems and solutions instead of listing general activities.

Component	Business Model Canvas (BMC)	Lean Canvas (LC)	Similarity / Difference
Key Resources	Main resources (human, physical, technological, financial).	Replaced by Key Metrics.	LC focuses on measurable performance indicators rather than describing resources.
Key Partnerships	Strategic partners that support operations.	Not included in LC.	LC excludes this component since early-stage startups typically have few fixed partners.
Cost Structure	All operational, production, and marketing costs.	Same as BMC.	Identical in both models.
Problem (Added in LC)	Not present in BMC.	Identifies the specific customer problems being solved.	LC adds this element to clarify real customer pain points.
Solution (Added in LC)	Not present in BMC.	Describes the proposed solution addressing the problem.	LC includes this to explain the product/service fit.
Unfair Advantage (Added in LC)	Not present in BMC.	Defines the startup's competitive edge that cannot be easily copied.	LC adds this to highlight a sustainable competitive advantage.

At the ideation or pre-product stage, when a startup needs to identify key assumptions, the Lean Canvas is the most suitable tool. Once those assumptions have been validated and the team is preparing to pitch to investors or develop a business plan, the Business Model Canvas (BMC) becomes more appropriate. During the growth stage, continuous iteration and refinement of revenue strategies and strategic partnerships are best supported by the BMC.

For most EE startups in Viet Nam, the Lean Canvas is particularly useful during the validation phase, while the Business Model Canvas becomes more relevant once pilot projects succeed and the team begins fundraising or operational planning.

Table 11: Comparison of Energy Efficiency (EE) Business Models

Criteria	ESCO Model (Energy Service Company)	PAYS Model (Pay As You Save)	EaaS Model (Energy as a Service)
Business model	ESCO designs, finances, implements, and operates energy efficiency projects. Costs are recovered from achieved energy savings.	Customers pay for investment costs through a portion of energy cost savings; and the payment is always lower than the estimated savings.	Customers pay a fee for energy services (e.g., lighting, cooling, compressed air) instead of investing in equipment.
Asset ownership	Usually belongs to the ESCO during the contract period and is transferred to the customer upon contract completion.	Usually belongs to the utility, financial institution, or equipment supplier until payment is completed.	Belongs to the service provider throughout the contract duration.
Payment mechanism	Payment from saved energy under Shared Savings or Guaranteed Savings models.	Repayment is collected through electricity bills and tied to the meter.	Pay a fixed service fee or based on actual usage.
Risk allocation	The ESCO bears the risk of energy saving performance; customers may bear credit risk.	The utility or financing organization bears most of the repayment risk.	The service provider bears equipment, operation, maintenance, and performance risks.
Contract duration	Medium and long-term (5–20 years).	Usually shorter than ESCO contracts and tied to the equipment payback period.	Medium and long-term (5–15 years).
Suitable audience	Large commercial buildings, industrial facilities, and public sectors needing large-scale retrofits and upgrades.	Households and small and medium-sized enterprises (SMEs) wanting to invest in high-efficiency equipment but having limited upfront capital.	Enterprises wanting to shift CAPEX to OPEX and focus on core operations.
Specific example	A hospital signs a 10-year contract with an ESCO to replace its air conditioning and LED lighting systems. The ESCO invests the entire cost. The monthly electricity savings are 100 million VND, and the hospital pays the ESCO 80% of this amount.	A household installs a rooftop solar system financed by the utility company. The monthly electricity bill decreases by 1 million VND, but they must pay an 800,000 VND PAYS surcharge on their electricity bill until the debt is cleared.	A factory signs an EaaS contract for a compressed air system. Instead of buying air compressors, they pay a monthly fee based on the actual amount of compressed air used (VND/m ³). The provider owns and maintains the entire system.

Case Study: Applying the Business Model Canvas – Eco-Sense Viet Nam

To illustrate how the Business Model Canvas (BMC) can be applied in practice, this section presents a hypothetical EE startup named Eco-Sense Viet Nam. The company aims to help industrial clients—specifically textile factories—optimize electricity usage through a smart, IoT-based energy management solution.

This case study provides a contextualized example of how a business model can be structured to align with the Viet Nameese market, with a focus on both technical viability and commercial sustainability.

BMC Block	Eco-Sense Viet Nam – Description
Customer Segments	Medium to large, export-oriented textile and garment factories located in industrial provinces such as Binh Duong, Dong Nai, and Bac Ninh. These clients face pressure from global brands to adopt greener operations.
Value Propositions	“Energy Cost Reduction Without Upfront Investment.” Eco-Sense offers a turnkey “Energy Management as a Service” model, using IoT sensors and data analytics to cut energy waste by at least 15% within 12 months.
Channels	Direct B2B sales team with engineering expertise. Business development efforts include attending relevant industry events (e.g., SaigonTex), leveraging networks like VITAS, and forming referral agreements with industrial park management boards.
Customer Relationships	High-touch engagement model. Each client is supported by a dedicated Account Manager, providing an initial audit, hands-on installation support, and quarterly energy savings reports. This builds long-term trust—a critical success factor in Viet Nam.
Revenue Streams	Tiered monthly subscription based on factory size and sensor quantity. A performance-based incentive model is also included—Eco-Sense shares part of the verified savings that exceed the guaranteed threshold, ensuring alignment with client outcomes.
Key Activities	Key operations include software R&D, maintaining the IoT sensor network, analyzing energy usage data, generating actionable insights, and conducting training for client teams.

Key Resources	Core assets are: (1) a proprietary data analytics algorithm, (2) a skilled team of energy engineers and data scientists, and (3) working capital to pre-finance sensor deployment for new clients.
Key Partners	Strategic partners include: (1) a reliable international sensor manufacturer, (2) local engineering firms for deployment support, and (3) potential partnerships with banks or green finance programs to facilitate performance-based contracting.
Cost Structure	Major costs include hardware procurement (sensors), technical salaries, cloud hosting (e.g., AWS), and sales & customer acquisition expenses. The company follows a value-driven cost structure with quality-first positioning.

4.3.3. Common Pitfalls and Best Practices in the Viet Nameese Context

Designing a viable business model is not just about filling out a canvas—it's about anticipating real-world challenges and adapting to local realities. In the Viet Nameese market, energy efficiency startups face specific cultural, financial, and operational barriers. Below are common pitfalls—and practical strategies to overcome them:

● Pitfall #1: Ignoring the Customer's Cash Flow and Budgeting Cycle

Many Viet Nameese enterprises, especially small and medium-sized businesses, operate under tight cash flows. They typically plan capital expenditures (CapEx) once per year, and unplanned spending—especially on new technology—is often blocked by internal approval processes.

Best Practice: Design your business model to fit into customers' financial rhythms. Shift from a large CapEx model to a service-based model—such as monthly subscriptions, leasing, or pay-as-you-save contracts. These models convert large upfront costs into manageable operating expenses (OpEx), reducing friction in the procurement process.

Timing matters: Engage buyers just before or during their annual budgeting cycle to increase chances of adoption.

● Pitfall #2: Overestimating Revenue and Underestimating Costs

Many early-stage founders are overly optimistic—assuming rapid sales, low marketing costs, and fast scaling. This often leads to financial stress and fundraising challenges down the road.

Best Practice: Be brutally realistic. Create three versions of your financial forecast:

- Conservative case (worst-case scenario)
- Realistic case (based on local market benchmarks)
- Optimistic case (best-case scenario)

Factor in long sales cycles, high-touch onboarding, and significant time for building credibility. Talk to other startups or mentors in the energy sector to benchmark customer acquisition costs (CAC) and average deal closure times.

● Pitfall #3: Vague or Unquantified Value Propositions

Statements like “we help reduce energy usage” are too generic. They fail to connect with busy factory owners or facility managers, who need concrete results to justify any investment.

Best Practice: Quantify your impact. Use real numbers drawn from pilots or discovery interviews. For example:

“Our solution saves the average textile factory $\text{₫}500\text{--}700$ million annually, with a payback period under 18 months.”

Such specificity builds trust, improves sales conversion, and makes your pitch more compelling to both customers and investors.

● Pitfall #4: Underestimating Viet Nam’s B2B Sales Complexity

In Viet Nam, B2B sales—especially to large factories or real estate firms—are rarely decided by a single person. Multiple levels of approval, cautious decision-making, and a high value on face-to-face trust mean sales cycles can stretch to 6–12 months.

Best Practice:

- Build a long pipeline early, knowing only a fraction will close.
- Use pilot projects to demonstrate value. A small, low-risk pilot with measurable results can turn into a powerful internal case study.
- Identify internal champions—employees who believe in your solution and are willing to advocate for it during internal decision-making processes.

● Pitfall #5: Trying to Do Everything Yourself

Energy efficiency projects involve technology deployment, installation, financing, performance monitoring, customer education—and sometimes policy navigation. Startups that try to manage all of these components alone often become overwhelmed or fail to scale.

Best Practice: Focus on your core competency and build strategic partnerships for everything else.

- Work with local engineering service providers for on-site installation and maintenance.
- Partner with industry associations to reach target customers faster.
- Collaborate with financing institutions or impact funds to offer pay-later or shared-savings options.

● Final Tip: Treat Your Business Model as a Living Document

Your business model is not fixed—it should evolve based on real-world feedback. Revisit and adjust your assumptions regularly, especially after customer interviews, pilot implementations, or major policy changes.

In a fast-changing market like Viet Nam, adaptability is not just an asset—it's a survival skill.

Founder Tip – Build for Viability, Not Just Vision

A great solution means nothing without a model that works in the real world. In Vietnam's energy efficiency space, success depends less on having cutting-edge technology and more on how you deliver, price, and build trust with customers who are cautious and cost-conscious.

Start with the simplest model that aligns with how your customers actually buy, not how you wish they did. Use local insights to adapt global ideas—what works in Singapore or Germany may flop in Binh Duong.

Your business model isn't a static plan—it's your engine for learning, earning, and scaling. Keep refining it as fast as your customers—and cash flow—require.

4.4 Stage 4 - Prototyping & Piloting: Making Your Solution Real

To reduce the risks of failure and accelerate learning, early-stage startups must rely on prototyping and piloting—two core tools that bring your ideas into the real world. While a prototype helps you learn quickly and cheaply, a pilot proves that your solution works in practice and delivers real value.

4.4.1. Prototype

A prototype is a preliminary version of your product or service, created to test key assumptions about usability, functionality, or desirability—without the time and cost of a full build. In the energy efficiency (EE) sector, prototyping is essential for refining your solution in collaboration with users before moving to larger-scale testing or investment.

Prototypes are not final products. They are intentionally rough, simple, and incomplete—but they are invaluable for learning.

Types of Prototypes for EE Startups:

Table 12: Type of prototypes for EE Startups

Type	Description	Example
Digital Mockups	Clickable wireframes or dashboards created with design tools like Figma or InVision	A smart energy dashboard showing usage alerts and savings estimates
Hardware Prototypes	Physical models, often using off-the-shelf parts or 3D printing for casing and sensors	A sensor unit prototype that monitors compressor energy consumption
Service Blueprints	A detailed diagram or manual walk-through of how a service is delivered	A step-by-step script for an on-site energy audit, delivered manually to test the flow
Concierge MVP	You manually perform a service you plan to automate later	A team manually analyzes energy bills and sends personalized reports to businesses

WHAT MAKES A GOOD PROTOTYPE?

Testable

The prototype is shared with real users for feedback.

Focused

The prototype tests one specific assumption.

Fast

The prototype can be created and tested quickly.

Cheap

The prototype avoids over-investment in expensive tools.



Figure 12: What Makes a Good Prototype

Prototyping Best Practices:

- **Start Low-Fidelity:** Begin with sketches, cardboard models, or simple spreadsheets. The goal is speed, not perfection.
- **Test with Real Users in Viet Nam:** Bring your prototype into factories, offices, or buildings. Observe how local users interact with it.
- **Document Feedback:** Record what users say, do, and feel. Note where they hesitate, misunderstand, or express enthusiasm.
- **Iterate Rapidly:** Update your prototype based on feedback and test again. Each iteration should bring you closer to a desirable, usable solution.

Tips:

The goal of prototyping is not to impress—it is to learn. Your best insights will come from watching users struggle or improvise with your prototype.

4.4.2. Pilot

A pilot is a controlled, small-scale implementation of your refined solution with a real customer in a real environment. While a prototype helps you learn, a pilot helps you prove. In Viet Nam's energy efficiency (EE) market—where trust, credibility, and data-driven proof are essential—pilots play a pivotal role in unlocking full-scale adoption and investment.

Why Pilots Matter for EE Startups: In the EE sector, especially in B2B contexts like factories, buildings, or logistics systems, customers are often risk-averse. They want evidence that your solution works before committing.

A well-designed pilot serves four key purposes:

- **Technical Validation:** Tests whether your solution works reliably in real-world conditions (heat, humidity, dust, inconsistent internet, etc.)
- **Value Proposition Validation:** Confirms whether your solution delivers measurable benefits (e.g., kWh saved, cost reduced, downtime avoided).
- **Operational Learning:** Reveals logistical challenges in installation, training, maintenance, and customer support.
- **Marketing Asset:** : Generates a case study, success metrics, and a referenceable customer—all essential for sales and fundraising

Tips:

A successful pilot is not just a technical win—it is often your first step toward building a reputation, creating word-of-mouth, and securing longer-term contracts.

Designing a Successful Pilot Project: A poorly executed pilot can do more harm than good—producing unreliable data, wasting resources, and damaging your credibility in the market. To maximize learning and impact, your pilot project must be planned and executed with precision and professionalism.

Step 1: Define Clear Objectives and Metrics:

Begin with a clear understanding of what success looks like. Your pilot objectives should follow the SMART principle—Specific, Measurable, Achievable, Relevant, and Time-bound. Once the objective is defined, specify the Key Performance Indicators (KPIs) to track during the pilot. These typically fall into three categories:

- **Technical:** Energy consumption (kWh before vs. after), system uptime, hardware reliability
- **Financial:** Monetary savings, payback period, Return on Investment (ROI)
- **User Experience:** User satisfaction, number of support incidents, ease-of-use feedback

Example Objective:

“To demonstrate that our smart lighting system can reduce lighting-related energy consumption by at least 40% in Wing A of Office Building X over a 3-month period, while maintaining or improving employee comfort levels.”

Tips:

Define how each KPI will be measured, what tools you’ll use (e.g., sub-meters, surveys), and how frequently data will be collected.

Step 2: Establish a Credible Baseline

Your impact can only be validated if there is a clear “before and after” comparison. This means capturing baseline data prior to installing your solution.

- For energy-related pilots, this might involve deploying temporary metering systems to monitor consumption patterns for 2–4 weeks before intervention.
- Ensure that data collection accounts for daily operational cycles, seasonal variations, and occupancy patterns (where relevant).
- Document qualitative context—e.g., operating hours, equipment usage schedules, or customer complaints—to complement quantitative metrics

Tips:

Without a trusted baseline, your savings claims may be dismissed by future customers and investors.

Step 3: Sign a Formal Pilot Agreement

Avoid informal arrangements. A structured Pilot Agreement or Memorandum of Understanding (MoU) sets expectations, assigns responsibilities, and protects both parties. This document also enhances credibility when you present your pilot results later.

Recommended Components of a Pilot Agreement:

- **Scope and Duration:** What will be deployed? Where will it be deployed? For how long will it be deployed?
- **Roles & Responsibilities:** Who provides what? For example, who provides the hardware, site access, data, and technical support?
- **Costs & Payment Terms:** Who covers which expenses? Startups often subsidize the pilot to lower the adoption risk for the customer.
- **Data Use & Confidentiality:** Who owns the data? How will the data be used? Can it be shared publicly or anonymized in a case study?
- **Success Criteria:** What KPIs will determine whether the pilot is considered successful?
- **Post-Pilot Options:** If the pilot is successful, what happens next? For example, will there be a purchase offer, expansion to more sites, or a co-marketing agreement?

Tips:

Including a data-sharing clause is especially important—your ability to showcase quantified success depends on this.

By carefully designing your pilot with clarity, accountability, and measurability, you set the stage not only for technical validation—but also for commercial credibility, investor confidence, and future scalability. A successful pilot becomes your first proof point—an asset you can repeatedly leverage throughout your startup journey.

Finding and Engaging Early Adopters and Partners in Viet Nam: Securing your first pilot partner is one of the most pivotal steps in an energy efficiency startup's journey. You are not just looking for a customer—you are seeking an early adopter: an organization or individual open to innovation, motivated by performance improvement, and willing to co-create value through experimentation. Early adopters tend to share specific traits: they are ambitious, sustainability-minded, and open to calculated risks that could improve their operations or reputation. In Viet Nam, promising sources include:

- **Companies with Public Sustainability or ESG Goals:** Large Viet Nameese firms and multinational corporations that issue Corporate Social Responsibility (CSR) or Environmental, Social, and Governance (ESG) reports are actively seeking credible, innovative solutions to meet their targets. Their public commitments create internal pressure—and opportunity.
- **Foreign-Invested Enterprises (FIEs):** *Factories or offices operated by companies from Europe, North America, or Japan often have corporate mandates for energy efficiency and sustainability. These firms may have more flexible budgets and greater willingness to test new technologies.*

- **Sector Leaders and Innovators:** Identify the top performers in your target industry—those known for embracing new technologies or leading on sustainability certifications (e.g., ISO 50001, LEED). These frontrunners often see innovation as a competitive advantage.
- **Industry Associations and Chambers of Commerce:** Organizations such as the Viet Nam Green Building Council (VGBC), Viet Nam Textile and Apparel Association (VITAS), and local chambers of commerce (e.g., EuroCham, AmCham) are excellent hubs to identify progressive enterprises.
- **Personal and Professional Networks:** Leverage existing connections from universities, incubator programs, professional associations, or LinkedIn. In Viet Nam, a warm introduction through mutual contacts is typically more effective than cold outreach.

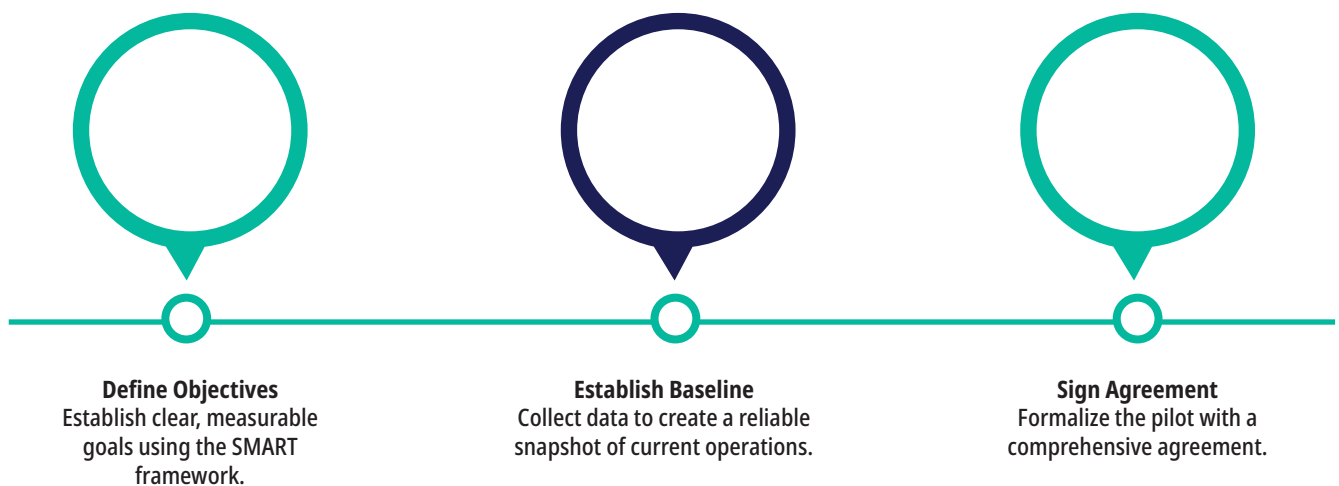


Figure 13: Steps to successful Pilot Project

How to Engage Potential Pilot Partners

Securing a pilot partnership requires both a compelling offer and a culturally aware engagement strategy.

Strategy	Description
Offer Clear Incentives	Lower the risk and increase the perceived value. Provide your solution free or heavily subsidized for the pilot duration. Cover installation and training costs. Make it easy to say yes.
Minimize Disruption	Emphasize that the pilot will not disrupt normal operations. Detail how installation and testing will be handled with minimal downtime.
Build Trust Through Relationships	In Viet Nam, long-term collaboration is rooted in trust. Take time to build rapport with decision-makers. Face-to-face meetings and transparency are essential.
Tailor the Narrative	Show that you understand the company's unique context. Use data or case studies relevant to their sector. Highlight how your solution aligns with their business priorities.
Frame the Pilot as Co-Learning	Position the engagement as a partnership, not a transaction. Offer them visibility as an "innovation leader" and the opportunity to shape a new technology that meets their needs.
Deliver Professional Materials	Present a clear pilot proposal—including objectives, success criteria, timeline, and support structure. This demonstrates seriousness and professionalism.

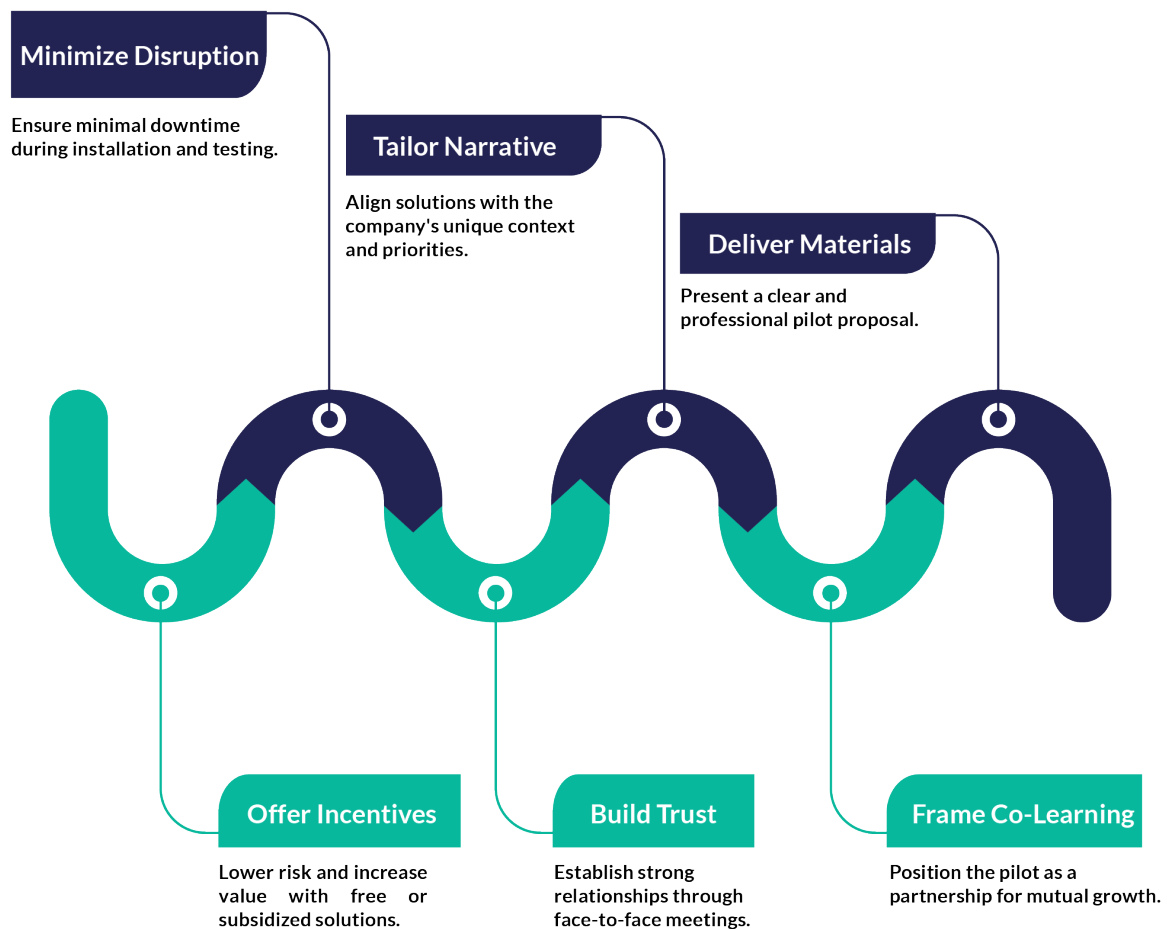


Figure 14: Strategies for securing pilot partnership

By identifying the right pilot partner and approaching them with a compelling, culturally sensitive proposal, you lay the groundwork for a successful proof of concept. A well-executed pilot—backed by trust and mutual value—can become your first major breakthrough in the Viet Nameese energy efficiency market.

Case Study 1: GreenLight's Smart Lighting Pilot in a Ho Chi Minh City Hotel

Sector: Commercial Buildings

Solution Type: Smart Lighting & Automation

Startup Stage: Prototype-to-Pilot Transition

Background: GreenLight, a Viet Nameese energy efficiency startup, developed a smart lighting system designed to reduce energy consumption in mid-sized hotels. Their goal was to validate both the technical performance and customer value proposition through a controlled pilot project.

Pilot Partner

A 4-star boutique hotel in District 1, Ho Chi Minh City. The hotel's General Manager (GM), an active member of a local hospitality business association, was concerned about rising electricity costs but also eager to modernize the guest experience.

Pilot Design

Scope: One full floor (1 of 8) of the hotel

Objective: Achieve a 50% reduction in lighting-related energy use while maintaining or enhancing guest comfort

Duration: 3 months

Baseline: Two weeks of sub-metered lighting data
Cost-Sharing: GreenLight absorbed all installation and operational costs

Execution: The installation was planned during a low-occupancy period to minimize disruption. However, a critical challenge emerged: the hotel's electrical diagrams were outdated. GreenLight's team had to manually trace circuits, adding one extra day to the installation timeline—an unexpected but valuable operational lesson.

Results:

Energy Reduction: 58% decrease in lighting energy consumption on the pilot floor

User Feedback: Housekeeping staff appreciated automated lighting shut-off, reporting improved workflow

Customer Satisfaction: The GM praised the pilot for cutting costs and enhancing the hotel's image as a modern, eco-friendly brand

Impact: The success of this professionally documented pilot—with pre/post data, photos, and a signed testimonial—became GreenLight's flagship reference. Within six months, they secured three new contracts with hotels in Da Nang and Nha Trang, using the pilot as a key proof point in their sales pitch.

Case Study #2: Thermo-Cycle's Waste Heat Recovery Pilot in a Catfish Processing Plant

Sector: Industry (Food Processing)

Solution Type: Industrial Waste Heat Recovery

Startup Stage: Technical Validation through Real-World Deployment

Background: Thermo-Cycle, an industrial energy efficiency startup, developed a compact heat recovery unit to capture excess thermal energy from boiler exhaust systems. Their target customers were energy-intensive agro-processing facilities across the Mekong Delta.

Pilot Partner

A large, family-owned catfish processing plant in An Giang province. The plant operated steam-based sterilization systems using natural gas-fired boilers—a major cost center.

Pilot Design

Scope: Retrofit one boiler with a compact waste heat recovery unit

Objective: Reduce natural gas consumption by $\geq 10\%$

Duration: 2 months

Monitoring: Continuous measurement via plant-installed and third-party-calibrated gas meters

Stakeholder Focus: Build trust with the factory's long-serving Chief Engineer

Execution: Rather than rushing installation, Thermo-Cycle took a deliberate relationship-building approach. They spent the first week on-site observing operations and addressing the Chief Engineer's reliability concerns. This trust-building was essential in securing operational buy-in.

Results:

Fuel Savings: Verified 12% average reduction in gas use

ROI: Payback period for full-scale deployment projected at 22 months

Organizational Buy-in: The initially skeptical Chief Engineer became the solution's biggest advocate

Impact: The pilot not only led to a full-system order but also established Thermo-Cycle's credibility with other members of the Viet Nam Association of Seafood Exporters and Producers (VASEP). It paved the way for broader B2B engagement, particularly in export-focused industries under pressure to improve energy efficiency and ESG performance

Founder Tip – Prove Small, Win Big

In Vietnam's energy efficiency (EE) market, credibility often matters more than promotion. Start with a simple prototype and focus on learning from real user needs rather than subjective assumptions.

Next, design your pilot program not only to validate your technology but also to build trust, provide tangible evidence, and unlock collaboration opportunities. A well-executed pilot can become your strongest sales tool – especially when backed by clear data, positive user feedback, and strong local relationships.

Don't underestimate the "soft" factors of success: patience, professionalism, and the ability to build personal connections can be just as important as the kilowatt-hours you help your customers save.

Finally, define how each KPI will be measured, the tools to be used (e.g., sub-meters, surveys), and the frequency of data collection.

4.5 Stage 5 - Launch: Bringing Your Venture to the Market

The launch phase marks your transition from idea validation to commercial reality. It is the moment your energy efficiency (EE) venture goes beyond pilot trials and begins to engage real, paying customers in the Viet Nameese market. This is a pivotal milestone. A well-executed launch can generate early momentum to attract investor interest, and establish your credibility. A mismanaged launch, however, can lead to confusion, wasted resources, and lost trust.

4.5.1 Crafting Your Go-to-Market (GTM) Strategy

Your Go-to-Market strategy is the blueprint for reaching customers and achieving early traction. Rather than trying to reach everyone at once, a focused GTM strategy helps maximize your limited resources and drive targeted growth.

1. Define Your Beachhead Market: Start by identifying a single, high-potential customer segment—your beachhead. This group should be:

- Highly motivated to adopt your solution
- Aligned with the success of your pilot
- Easily reachable through defined channels

Example:

Instead of targeting "all commercial buildings," GreenLight, a smart lighting startup, focused on "4- and 5-star hotels in Ho Chi Minh City's central districts." This helped them fine-tune their message and concentrate sales efforts effectively.

2. Refine Your Value Proposition Messaging: Your value proposition must answer the customer’s core question: *“Why should I care about your solution now?”*. Make your messaging specific, data-driven, and benefit-oriented. Take GreenLight as an example:

- **Weak:** *“We help hotels save energy.”*
- **Strong:** *“GreenLight provides a smart lighting solution that reduces hotel lighting costs by over 50% within 3 months—no upfront investment required.”*

Back this up with pilot results, local proof points, and testimonials. Avoid technical jargon—speak in terms your beachhead market understands.

3. Choose Your Initial Sales Channels: Pick one or two primary sales and distribution channels based on where your customers spend their time and make buying decisions:

- For B2B solutions: Direct sales through a technical, consultative approach
- For standardized offerings: Strategic partnerships or digital platforms
- For niche segments: Industry events, association networks, and government programs.

4.5.2 Choosing the Right Sales and Distribution Model for Viet Nam

Selecting an appropriate sales and distribution model is a strategic decision that will influence how effectively your energy efficiency (EE) startup reaches customers and scales. In Viet Nam, where business culture is shaped by trust, hierarchy, and often complex procurement processes, your model must align with your product’s characteristics and your target customers’ purchasing behaviors.

Below are four primary models to consider, along with recommendations for how they can be adapted to Viet Nam’s unique market dynamics.

Direct B2B Sales: This model is essential for complex, high-ticket EE products and systems—such as industrial energy audits, building energy management systems (BEMS), or HVAC retrofit services.

Key features

Requires a technically fluent sales team (“sales engineers”) who can both explain the value proposition and address engineering concerns.

Sales processes are long and relationship-driven—especially for state-owned enterprises or large corporations.

Viet Nam-specific considerations

Expect sales cycles of 6–18 months.

Decision-making often involves multiple layers: engineers, finance controllers, procurement officers, and general directors.

Frequent in-person visits, site assessments, and trust-building are necessary. Cultivating a single “champion” inside the company who will advocate for your solution can make or break the deal.

Example: An EE startup offering an AI-powered chiller optimization system for large hospitals would need to send an engineer to assess baseline data, customize the proposal, and present findings in person to both the technical and executive boards.

Channel Partners: This model involves working with local distributors, value-added resellers (VARs), engineering service companies, or energy consultants who already have access to your target customers.

When to use

When your product complements existing offerings—such as efficient motors, LED lighting, or smart controls.

When your team lacks local presence in key provinces.

Success factors

Provide partners with training, sales scripts, and technical documents.

Sign clear agreements on revenue share, support responsibilities, and use of your brand.

Viet Nam-specific tip: Target companies already selling to industrial zones or public sector projects—many are hungry for differentiated, high-tech solutions that add value to their portfolio.

Example: A startup selling energy-efficient water pumps could partner with a leading industrial supplier in Bac Ninh or Long An, bundling their product into existing mechanical system upgrade packages.

Online and Digital Distribution: Digital channels are ideal for low-cost, modular EE products—especially hardware-software bundles (e.g., smart plugs, energy monitors) and SaaS tools.

Tactics

Build an e-commerce-ready website with technical specifications, demo videos, and live chat support.

Use SEO to appear in energy forums, Google search results, and industry blogs.

Launch targeted ad campaigns (Google Ads, LinkedIn for B2B, Facebook for SMEs/homeowners).

Challenges

Digital trust is still evolving in Viet Nam. Customers may hesitate to buy unseen products from unfamiliar brands.

Fulfillment and customer service need to be fast and reliable, especially in Tier 2–3 cities.

Best practice: Offer cash-on-delivery options and create demo video content in Viet Namese with subtitles.

Leveraging Government or Utility Programs: Viet Nam’s government and major utilities like EVN (Viet Nam Electricity) occasionally roll out national EE programs, including subsidy schemes, demonstration pilots, and green procurement drives.

When to use

Builds instant credibility.

Reduces customer acquisition costs by tapping into pre-approved funding or program outreach.

Aligns your startup with Viet Nam’s broader green growth strategy.

Success factors

Monitor announcements from MOIT, VEA, and EVN.

Ensure your solution meets technical standards for program inclusion.

Position your pilot data as evidence for future policy inclusion.

Example: A startup whose product is eligible under a MOIT-led public building retrofit initiative could gain preferred vendor status—giving them privileged access to dozens of municipal clients.

In Summary:

Sales Model	Best For	Success Factors in Viet Nam
Direct B2B Sales	High-value, complex solutions	Trust-building, multi-level engagement, technical fluency
Channel Partners	Mid-value or complementary products	Leverage partner credibility, training & margin clarity
Digital Sales	Low-cost, scalable products	Strong website, Viet Nameese content, visible customer service
Gov't/Utility Programs	Aligned EE solutions with public goals	Timing, policy fit, strategic visibility

Whichever model you choose, ensure that your sales and distribution approach is grounded in empathy for your customer’s decision-making process—and adapted to Viet Nam’s specific business culture. A localized GTM strategy, combined with disciplined execution, is key to unlocking sustainable market traction.

4.5.3 The Launch Plan: Soft Launch vs. Hard Launch

A well-executed launch is not just about “going public”—it is about making sure your venture enters the market with clarity, credibility, and operational readiness. In the context of Viet Nam’s energy efficiency sector, where customer trust and word-of-mouth are essential, the method and timing of your launch must be deliberate and strategic.

You have two main options for the launch itself: Soft launch and Hard Launch

	Soft Launch	Hard Launch
Description	A limited, controlled rollout to early users (e.g., pilot partners, waiting list) to test operations and collect feedback.	A broad public announcement through media, events, and marketing to generate awareness and leads.
Purpose	Validate processes, ensure readiness, gather testimonials, and refine product/service before scaling.	Create high visibility, attract attention from customers and investors, and accelerate market penetration.
Recommended For	Most B2B EE startups in Viet Nam where trust and relationships are critical.	Startups that have completed a successful soft launch and are ready to scale.
Risks	Low risk. Limited exposure allows for controlled learning and iteration.	High risk. Unprepared operations can lead to poor customer experience and brand damage.
Best Practices	Document learnings, refine sales and support workflows, and use results in future marketing.	Ensure operational readiness, prepare case studies, and align with a strong PR strategy.

Developing Your Launch Timeline and Checklist: Whether you opt for a soft or hard launch (or both in sequence), you should prepare a comprehensive launch plan that includes:

Key Activities	Checklist
Marketing Collateral	✓ Updated website with clear value proposition and pilot results ✓ Downloadable brochures and explainer videos in Viet Nameese ✓ Professionally designed case studies/testimonials
Sales Readiness	✓ Pricing and payment terms Pnalized ✓ Contracts and onboarding templates prepared ✓ Sales pitch deck tailored to the Viet Nameese marke
Team Preparation	✓ Customer support processes tested ✓ Internal FAQ and training documents developed ✓ Clear roles assigned for lead response and follow-up
Operational Readiness	✓ Installation timelines conPrmed ✓ Inventory or hardware availability secured ✓ Data collection and reporting tools fully functional
Media & Outreach (for Hard Launch)	✓ Press release drafted and translated ✓ Launch event plan (venue, guests, agenda) ✓ Targeted media list with journalist outreach strategy

Your launch plan should include a timeline and a checklist of activities, including preparing marketing collateral (brochures, case studies from your pilot, website content), finalizing your pricing and contracts, and training your team to handle inquiries. By carefully planning your launch—starting small, learning quickly, and scaling smartly—you will set your venture on a trajectory for long-term credibility and success in Viet Nam’s dynamic energy efficiency market.

4.5.4 Preparing for Your First Customers: Onboarding and Support

Your first customers are not just buyers—they are the foundation of your brand reputation, the source of your first testimonials, and potentially your earliest promoters or detractors. Ensuring their success is not a one-time event but a process that begins with onboarding and continues through ongoing support. In Viet Nam, where word-of-mouth and trust are paramount, this stage can make or break your venture.

Onboarding: Build Confidence from Day One: Onboarding is your customer's first real experience as a paying client. It must feel smooth, professional, and reassuring. Your goal is to help them start receiving value as quickly and effortlessly as possible. Best practices include:

- **Kick-off Meeting:** Set clear expectations by outlining the scope, timeline, and next steps. In Viet Nam, in-person meetings or video calls often help establish stronger rapport and trust than emails alone
- **Installation Timeline:** Provide a simple, step-by-step plan—particularly for hardware-based EE solutions—to avoid surprises or delays.
- **Training & Handover:** Train the customer's technical and operations staff to use your solution confidently. For B2B industrial clients, this may involve creating a simple training manual or video series in Viet Nameese.
- **Documentation Package:** Offer a localized user guide, FAQs, and quick-start checklists tailored to Viet Nameese operating conditions and energy regulations.

Customer Support: Deliver Fast, Reliable, Human-Centered Help: Your customer support setup doesn't need to be high-tech, but it must be responsive and trustworthy—especially in the early stages. Essentials include:

- **Multiple Channels:** Ensure clients can easily reach you via email, phone, and possibly Zalo (popular in Viet Nam). Clearly publish your support hours and response time.
- **Founders on the Frontline:** In the first phase, founders or technical leads should directly handle inquiries. This gives you firsthand insights into real-world usage, customer pain points, and product improvement areas.
- **Quick Response, Thoughtful Resolution:** A fast fix builds loyalty; a slow or careless reply risks damaging your reputation. Even when the answer is "we're still fixing this," being transparent and proactive can win long-term trust.

Turn Customers into Champions

- After a successful onboarding and support experience, proactively ask customers for feedback and testimonials.
- Turn satisfied clients into reference cases or even co-presenters at industry events.
- Celebrate their success using your solution—feature them on your website or social media with their permission.

Key takeaway: The launch of your energy efficiency startup doesn't end when the contract is signed—it begins with how you deliver and support. In Viet Nam's relationship-driven business culture, your first ten customers are your ambassadors. Treat them accordingly, and they will help you grow far beyond what any marketing campaign could.

Founder Tip – Win Early, Deliver Well:

Your launch isn't about making noise—it's about making your first customers successful. In Vietnam, where trust and relationships drive business, those first few clients will either open doors or close them.

- *Focus your Go-to-Market efforts on a narrow, reachable segment.*
- *Speak their language, prove your value, and then overdeliver.*
- *Treat onboarding like a partnership, not a transaction.*

Every installation, support call, or follow-up is part of your brand story. Your first 10 customers aren't just revenue—they're your reputation. Nail that, and growth will follow.

4.6 Stage 6 -Scale-Up: Growing Your Impact and Your Business

After launching your venture and securing your first wave of customers, your focus must shift from proving viability to achieving sustainable growth. The scale-up phase is where your startup moves from experimentation to execution at a larger scale. It requires strategic planning, disciplined management, and a long-term mindset. Your mission now is to expand your reach, grow your revenue, deepen your impact, and build the capabilities of an organization that can operate at scale.

4.6.1 Building a Sustainable Competitive Advantage

Growth attracts competition. As you scale, incumbents and new entrants may attempt to copy your idea. To maintain your lead, you must develop durable advantages that are difficult to replicate.

Key Strategies:

- **Technological Leadership:** Continue investing in R&D to improve product performance, lower costs, and maintain innovation. Protect intellectual property through patents, trademarks, or by keeping key algorithms proprietary.
- **Data Advantage:** Over time, your data becomes one of your most powerful assets.

Example: After serving 100 textile factories, Eco-Sense Viet Nam Viet Nam can benchmark energy use and offer data-driven insights that new entrants cannot replicate. This growing dataset can also improve your analytics, enabling predictive maintenance or personalized recommendations.

- **Brand & Trust:** A strong brand built on performance, service, and transparency builds customer loyalty. Protect this asset by maintaining service excellence and reinforcing your mission. Establish a Customer Advisory Board to ensure continuous alignment with client needs.

4.6.2 Leveraging Finance for Growth

Scaling often requires additional capital to fund team growth, product expansion, or customer acquisition. Fortunately, the cleantech financing landscape in Viet Nam Viet Nam is evolving.

Equity Financing: Angel Investors and Early-Stage Venture Capital: These investors provide equity capital in exchange for ownership stakes. They are ideal for startups looking to fund team expansion, product development, or market entry. What They Look For:

- Evidence of product-market fit: pilot success, customer testimonials, initial revenues.
- Scalability: ability to expand to similar customers or geographies.
- Strong team: with execution capability, sector knowledge, and vision alignment.
- Impact potential: many VCs now apply ESG or climate impact lenses

Tips:

Focus on Southeast Asia-based VCs with climate-tech or clean energy portfolios (e.g., VinaCapital Ventures, Patamar Capital, Earth VC). Target climate-focused angel groups, such as those affiliated with AVPN or Impact Circle.

Equity Financing: Later-Stage VCs and Strategic Investors: As your business matures, larger VC funds or corporate venture arms may come in with growth capital. Examples:

- A large HVAC manufacturer investing in your smart control technology.
- A real estate group funding your EE solution to integrate across its building portfolio.

Debt and Project Finance: For startups delivering physical infrastructure (e.g., ESCOs, smart lighting, solar+storage), capital is needed for equipment purchases, installations, and working capital. Debt becomes more relevant once the startup demonstrates reliable cash flow.

- **Commercial Loans (Bank Finance)**
 - Viable once you've secured recurring contracts or a proven revenue stream.
 - Challenges may include high collateral requirements and risk aversion from Viet Namese banks toward unproven technologies or business models.
- **Blended Finance and Risk-Sharing Facilities:**
 - Programs such as the World Bank's VSUEE (Viet Nam – Viet Nam Scaling Up Energy Efficiency) offer partial credit guarantees, enabling commercial banks to lend more comfortably to EE projects.
 - Other international initiatives (e.g., ADB's CEFIA, GIZ's Green Economic Development) provide concessional finance or de-risking mechanisms.

Tips:

Partner with an Energy Service Company (ESCO) or EPC provider that has an existing relationship with local banks. Structure your projects to demonstrate cash-flow predictability and risk mitigation.

As your business matures, larger VC funds or corporate venture arms may come in with growth capital. Examples:

- **Grants from Development Agencies and NGOs:**
 - These funds do not require equity and are highly valuable for de-risking innovation or entering new markets.
 - Eligible sources: GIZ, The Global Innovation Fund, Climate-KIC, or UNDP Climate Innovation Accelerator
- **Competitions and Accelerators:**
 - Winning startup competitions brings visibility, funding, and investor interest.
 - Regional platforms like Switch-Asia, ASEAN Catalytic Green Finance Facility, or Clean Energy Challenge SEA are also accessible.

Corporate Partnerships and Strategic Co-Financing

- **Distribution or Technology Integration Partners:** Large companies may provide funding in exchange for exclusive distribution rights or product integration into their systems.
- **Strategic Investments or Acquisitions:** A multinational may co-invest in scaling your operations if your technology aligns with their sustainability goals (e.g., carbon footprint reduction, digital transformation).
- **Utility or SOE Collaboration:** Collaborate with EVN, local DOITs, or industrial parks participating in government-linked EE initiatives. This can unlock subsidized finance and technical assistance.

Table 13: Financial Options for EE Startups in Viet Nam

Type	Purpose	Ideal Stage	Key Sources
Equity – An-gel/ VC	Team, product, market entry	Early to Growth	Patamar, VinaCapital, Earth VC, Impact Circle
Debt –Commercial Loans	Equipment, working capital	Growth	Vietnamese banks, VSUEE support
Risk-Sharing Facilities	De-risked EE project finance	Post-revenue	World Bank, ADB, GCF
Grants	Innovation, early pilots, branding	Early-stage	GIZ, UNDP, SWITCH-Asia
Competitions	Visibility, credibility, seed cash	Idea to Early-stage	Climate Launchpad, Viet Nam CIC
Strategic Partnerships	Scale-up, market access	Growth	EVN, industrial firms, real es-tate groups, corporates

Tips:

Before seeking large-scale funding, ensure your venture is investor-ready:

- Prepare a data-backed pitch deck: clearly outline your impact, traction, business model, financials, and roadmap.
- Maintain clean financial records and projections.
- Build an advisory board or engage mentors with fundraising experience.
- Tailor your fundraising narrative to highlight both climate impact and commercial scalability.

4.6.3. Measuring Sustainability and Growth Metrics

Scaling a business takes more than ambition—it demands careful planning and precise execution. The ability to track, interpret, and act on key performance indicators (KPIs) is what separates successful startups from those that lose direction as they expand. Measurement ensures alignment between your operations, financial health, and mission impact. It also builds credibility with investors, partners, and customers.

For energy efficiency startups, metrics must reflect not only business performance but also environmental outcomes. A well-designed KPI system helps you stay focused on what matters most, make data-driven decisions, and continually demonstrate value to stakeholders.

Business Growth Metrics: These metrics help assess the commercial viability and scalability of your business model.

Table 14: Summary of Business Growth Metrics

Metric	What It Tells You	Why It Matters
Revenue Growth Rate	The rate at which your revenue is increasing over time (monthly, quarterly, annually).	Signals market traction and helps forecast scale potential. Investors closely watch this.
Customer Acquisition Cost (CAC)	Total sales and marketing spend divided by the number of new customers acquired.	Helps evaluate the efficiency of your growth efforts. High CAC with low return = unsustainable model.

Customer Lifetime Value (LTV)	Total expected revenue from a single customer throughout their relationship with your company.	Indicates how much you can afford to spend to acquire customers. A healthy LTV:CAC ratio is typically >3:1.
Gross Margin	Revenue minus direct costs of goods/services sold.	Key indicator of profitability. In capital-intensive EE businesses, understanding unit economics is critical.
Churn Rate	The percentage of customers who stop using your service in a given period.	High churn suggests poor retention or unmet expectations. This metric is vital for subscription-based or recurring service models.
Net Revenue Retention (NRR)	Measures recurring revenue changes among existing customers (expansion, contraction, churn).	An NRR >100% means you're growing revenue without acquiring new customers—a strong signal of product value.

Sustainability and Impact Metrics: As a startup operating in the energy efficiency space, your mission is not only to grow your business but also to reduce environmental impact and contribute to national climate goals. Measuring your solution's tangible benefits reinforces your value proposition and unlocks funding from climate-conscious investors and public institutions.

Table 15: Summary of Sustainability and Impact Metrics

Metric	Description	Practical Tip
Total Energy Saved (kWh)	Aggregate energy savings delivered to customers across all projects.	Use metering data, before-after comparisons, and engineering estimates. Present results clearly and conservatively.

GHG Emissions Avoided (tons CO ₂ e)	CO ₂ e reductions based on energy savings and Viet Nam's grid emissions factor.	This is your "climate impact" metric. Use accepted conversion factors (e.g., 0.63 tons CO ₂ e/MWh for Viet Nam).
Payback Period (months)	Average time it takes customers to recoup their investment in your solution.	The shorter the payback, the stronger your sales case. Track this closely per customer segment.
Environmental Return on Investment (eROI)	A ratio of emissions saved per dollar spent.	Increasingly relevant for impact investors and international donors.
Customer Satisfaction (CSAT/NPS)	Quantitative feedback from users. NPS measures the likelihood of customer referrals.	Deploy quick satisfaction surveys post-installation or periodically. NPS above 30 is a good benchmark in B2B EE.

Operational Metrics: Operational KPIs help ensure you're scaling efficiently, without compromising service quality or burning out your team.

Table 16: Summary of Operational Metrics

Metric	Why It Matters
Deployment Time per Customer	Measures operational efficiency. Long installation or onboarding times slow growth. Use it to refine your processes.
Support Ticket Volume / Resolution Time	Tracks customer support load and service quality. Identify pain points and improve FAQs or training.
Utilization of Field Teams	In hardware or service-based models, this reflects how efficiently your technical teams are being deployed.

Conversion Rate from Pilot to Paying Customer

A critical measure of your pilot strategy's effectiveness. Should improve over time with better targeting.

Tools and Practices for Effective Measurement:

- **Dashboards:** Implement tools like Google Data Studio, Power BI, or simple spreadsheets to visualize real-time performance.
- **Customer Feedback Loops:** Use automated surveys (e.g., Typeform, Google Forms) and integrate them into your CRM.
- **Impact Reporting:** Periodically publish impact reports or case studies—especially useful for engaging with donors or ESG-aligned investors.
- **Benchmarking:** Continuously compare your results with industry benchmarks (where available) to contextualize your performance.

4.6.4 Scaling Up

Scaling a startup is not simply about acquiring more customers—it's about evolving your internal organization to handle complexity, sustain performance, and retain agility as you grow. This shift from a lean, founder-driven team to a structured, professionally run company is one of the most important and challenging transitions your venture will face.

Step 1: A. Strategic Hiring and Team Building: As the company scales, it must transition from a multitasking team to clearly specialized functions: sales, marketing, engineering, and customer support. Priority should be given to hiring individuals who fit the company culture, demonstrate strong teamwork, and show long-term commitment. Building a core team of local Vietnamese staff helps reduce reliance on external parties and ensures deep understanding of the domestic market. Once the team reaches 10–15 employees, job descriptions, onboarding processes, and performance evaluation systems should be standardized. The objective is to establish a stable human-resources foundation for subsequent growth.

Step 2: Standardizing Systems and Operating Processes: Early manual processes will quickly become overloaded as scale increases. The company needs a CRM system for customer management, an ERP system for finance and operations, and project management tools to support cross-functional coordination. In parallel, real-time financial reporting should be implemented to monitor cash flow and unit costs. The goal is to create a smooth operating system that minimizes dependence on individual employees.

Standard Operating Procedures (SOP):

Document key processes such as system setup, customer support, billing, and pilot project implementation.

SOPs help reduce dependence on individual employees, accelerate onboarding for new hires, and ensure consistent operational quality as the organization scales.

Step 3: The Founder's Evolving Role: Founders can no longer “do everything themselves” and must shift to a strategic role. Their focus should be on defining long-term vision, shaping organizational culture, and attracting top talent. Founders must proactively manage relationships with investors and partners while preparing for increasing capital needs. At the same time, they need to genuinely delegate authority to specialized teams and avoid micromanagement. This transition is critical for enabling the company to operate independently of the founder.

Tips:

Viet Nam's startup culture is still maturing, and founders often struggle with delegation. Invest in leadership coaching or mentorship if needed. It will pay off.

Step 4: . Governance and Leadership Structure: Larger scale requires a clear organizational structure, with each function having a designated leader and transparent reporting mechanisms. The company should hold regular management meetings with defined KPIs and action plans to ensure alignment. When preparing for Series A funding or beyond, it is advisable to establish an advisory board or a board of directors to strengthen oversight and strategic decision-making. A robust governance structure supports stable operations and risk mitigation.

Step 5: Building and Sustaining Corporate Culture: Culture determines how teams work and make decisions when the founder is no longer closely involved. Core values must be clearly articulated and embedded in recruitment, performance evaluation, and daily operations. The company should recognize key achievements, particularly those aligned with its mission. Transparency in sharing performance results and challenges helps maintain team cohesion. A strong culture creates a sustainable competitive advantage.

Founder Tip – Scale What Works, Systemize What Matters

Scaling isn't just doing more—it's doing better at scale. The Vietnamese market will reward consistency, credibility, and execution far more than flashy ideas. Protect your early wins by investing in what makes them repeatable: a capable team, well-documented processes, clear metrics, and strong internal culture.

Don't just chase growth—build the systems that sustain it. And remember: your job as founder evolves. As you step back from day-to-day operations, step up as a strategist, team builder, and storyteller who can align people, capital, and purpose around long-term impact.

4.7 References: Practical Resources for Growing an EE Startups

Successful energy efficiency (EE) startups grow by learning and iterating. At every stage of your journey — from ideation to scaling — it's essential to pause, assess your progress, and make informed decisions before moving forward.

This section introduces a structured self-assessment toolkit designed to help founders reflect, refine, and refocus at the end of each phase. The tools are organized into checklists, reflection questions, and KPIs aligned with the startup stages described in Chapter 4, including:

- Document #1 – Ideation Stage – Checklist & KPIs
- Document #2 – Validation Stage – Checklist & KPIs
- Document #3 – Business Model Development – Checklist & KPIs
- Document #4 – Prototyping & Piloting – Checklist & KPIs
- Document #5 – Launch Stage – Checklist & KPIs
- Document #6 – Scaling Stage – Checklist & KPIs
- Document #7 – Building the Organization for Scale: A Founder's Checklist

Access these materials by scanning the QR code below.



CHAPTER

05

**FINANCE AND INVESTMENT
OPPORTUNITIES**



CHAPTER 5.

FINANCE AND INVESTMENT OPPORTUNITIES

Access to finance is one of the most critical enablers—and barriers—for EE startups. EE startups often require a combination of hardware, engineering services, and compliance with technical regulations. These characteristics mean longer development cycles, upfront capital needs for prototyping and piloting, and a greater reliance on public-private partnerships.

In Viet Nam, where public and private sectors are increasingly prioritizing energy efficiency and green growth, early-stage EE startups still face significant challenges in mobilizing appropriate funding. Most generalist investors and accelerators remain unfamiliar with EE's value proposition, and few financing programs are tailored to support hardware-heavy or deep-tech business models that aim to reduce energy use.

Despite these barriers, the market outlook is promising. Viet Nam's startup ecosystem has seen a rise in venture capital and blended finance options in recent years—with investment in climate tech and clean energy growing steadily. From 2015 to 2023, climate tech startups in Viet Nam raised \$93.8 million across 120+ public deals, with investment surging 365% from 2021 to 2023. In 2024, deal activity remained strong, reaching \$23 million—about 19% of the country's total tech startup funding that year as reported by Tracxn for Viet Nam in 2024.

While most funding still flows into renewable energy, electric vehicles, and agri-tech, the energy efficiency sector is emerging as a high-impact yet underinvested opportunity.

This chapter explores the funding journey in detail—from understanding the funding ladder and financial instruments, to preparing for investor engagement and post-investment success.

5.1. Funding ladder by startup stage

The concept of a “funding ladder” illustrates the typical progression a startup makes through various financing stages, from its inception to maturity. Each rung on this ladder corresponds to a different phase of the company's development, characterized by distinct milestones, funding amounts, investor types, and expectations. For Vietnamese startups, understanding this progression is crucial for strategic fundraising and aligning growth objectives with investor criteria. The journey up this ladder requires not only innovation but also a keen awareness of how investor scrutiny and demands evolve.

The following table outlines the typical funding ladder for startups in Viet Nam:

Table 17: Outline the typical funding ladder for startups in Viet Nam

Stage	Typical Fund-ing (USD)	Key Funding Sources in Viet Nam	Startup Goals	Investor Focus	Typical Dilution
Ideation / Pre-Seed	\$10k – \$250k	Bootstrapping, Friends & Family, Incubators, early Angels, Grants & Prizes	Define problem, build MVP, form founding team, do early market testing	Strong team, big prob-lem/opportunity, founder commitment, early product direction	5–15%
Seed	\$50k – \$500k+	Angels, Micro-VCs (e.g., ThinkZone, AVV, Antler), some CVCs	Product-market fit, early traction, grow team, pilot deploy-ments, early revenue	Traction, clear use case, market valida-tion, business model, scale potential	10–20%
Series A	1M – \$5M+	Local/Intl. VCs (e.g., Do Ventures, VinaCapital, 500 Global), Corporate VCs	Scale operations, expand team, grow revenue, im-prove unit economics	Revenue growth, proven model, team strength, customer ac-quisition strategy, ear-ly signs of profitability	15–25%
Growth (Series B+)	\$5M – \$15M+	Growth funds, Private Equity, Strategic Inves-tors, Intl. VCs	Market leadership, profitability, regional expansion, prepare for exit	Consistent growth, market dominance, strong metrics, ex-it-readiness, gover-nance	10–20% per round

Note: Vietnamese startups raised \$94.4M in early-stage capital in 2024, down 47%. Seed funding dropped 32% to \$11.7M. Late-stage funding remains modest but shows signs of recovery (\$14.2M in 2024)⁵⁷.

1. Ideation / Pre-Seed Stage: At this early phase, founders are validating the problem and experimenting with initial solutions. An MVP (Minimum Viable Product) is built to test assumptions, and the team is often just the core founders.

- **Funding Sources:** Personal savings (bootstrapping), friends and family, incubators (e.g., NIC, SIHUB), early-stage grants and pitch prizes (e.g., AIS4EE Youth Track).
- **EE Example:** A team testing a low-cost sensor to monitor industrial energy use could apply for a youth innovation grant or join a university incubator.

Tips:

Focus on clearly identifying the problem, understanding the market context (e.g., energy consumption in factories or buildings), and preparing a simple prototype or demo.

2. Validation / Seed Stage: By now, you have a functional product, tested by early users or pilot customers. The goal is to validate product-market fit, collect real feedback, and start generating revenue or key usage metrics⁵⁸.

- **Funding Sources:** Angel investors, micro-VCs (e.g., AVV, ThinkZone, Antler), strategic CVCs, and programs like AIS4EE Startup Track.
- **EE Example:** A startup with a smart HVAC management system running in 2–3 buildings shows early energy savings and applies for angel investment to expand to 10–15 customers.

3. Early Traction / Series A: This stage is all about scaling. You've proven the product works—now it's time to grow revenue, acquire customers systematically, and strengthen your operations.

- **Funding Sources:** Larger VC firms (local and international), Corporate VCs (e.g., FPT, VinVentures).
- **EE Example:** A clean-tech company reducing factory energy use now has 20+ clients and needs \$2M to expand to new cities and automate reporting tools.

Tips:

Document customer feedback, refine your pitch deck, and show early signs of traction (e.g., kWh saved, % cost reduction).

4. Scaling / Series B and Beyond: This stage is all about scaling. You've proven the product works—now it's time to grow revenue, acquire customers systematically, and

⁵⁸ Annual Recurring Revenue (ARR): The amount of recurring revenue a company can expect to receive over the course of one year. Customer Acquisition Cost (CAC): The average cost incurred to acquire a new customer.

Loan-to-Value (LTV) Ratio: The ratio between the loan amount and the value of the asset being purchased or pledged as collateral.

strengthen your operations.

- **Funding Sources:** Growth equity funds, private equity firms, global strategic partners, sovereign funds.
- **EE Example:** An energy management platform serving large industrial parks seeks \$10M+ to expand across Southeast Asia and integrate with carbon credit trading platforms.

Tips:

Demonstrate operational excellence, customer retention, strong governance, and a roadmap to profitability or liquidity event.

5. Key Takeaways for EE Startups

- **Ideation/Pre-Seed:** Use non-dilutive sources (grants, incubators), and keep your team lean. Focus on solving a real, validated problem before approaching investors.
- **Seed Stage:** Vietnamese investors are cautious—show traction with pilot projects, tech prototypes, or initial revenue. Consider blended finance (grants + equity) for EE tech.
- **Series A:** Be ready with clear KPIs and investor-ready materials. Investors expect a strong customer pipeline, reliable cash flows, and scalability evidence.
- **Growth Stage:** At this level, you must show clear leadership in your market segment and operational efficiency. EE startups with industrial or government partnerships may gain an edge here.

For Deeptech⁵⁹, hardware⁶⁰, or ESCO⁶¹ startups, the development and commercialization cycle is typically longer than that of SaaS⁶² models due to complex R&D requirements, high testing costs, and the need to prove technological effectiveness under real-world conditions.

59 “Deep tech” refers to startups or enterprises that develop technology based on scientific discoveries or significant engineering innovations, rather than relying on existing or incremental technologies.

(Source: <https://www.techtarget.com/searchenterpriseai/definition/deep-tech>)

60 A hardware startup is a new venture focused on designing, manufacturing, and commercializing physical products—such as devices, machinery, electronic circuits, or sensors—rather than purely software products. Examples include IoT devices (network-connected sensors), small robots, portable medical devices, and wearable technology.

61 An ESCO startup is a company that provides energy-saving and energy-management services for customers, where revenue is tied to the actual energy savings achieved.

(Source: <https://globalesconetwork.unepccc.org/policy-advice/a-fit-for-purpose-definition-of-escos/>)

62 The SaaS (Software as a Service) model is a software delivery approach in which users access the application via the Internet—typically through a web browser—instead of installing it on their computers. The provider is responsible for operating, maintaining, and updating the system.

(Source: <https://www.gartner.com/en/information-technology/glossary/software-as-a-service-saas>)

In the early stages, companies must focus on refining prototypes, conducting pilot projects, and protecting intellectual property (IP). Consequently, funding often comes from non-dilutive grants, innovation support programs, and technically knowledgeable angel investors. This combination helps reduce equity dilution pressure while building a solid foundation of technological proof before entering the Series A round.

As startups progress, the fundraising pathway for Deeptech ventures diverges from SaaS — shifting emphasis from “user growth” to “proving reliability and commercial viability of technology.” Series A rounds typically aim to scale up production, implement additional demonstration projects, and prepare for initial commercial contracts. At this stage, strategic investors, ESCOs, or industry players often play a more crucial role than traditional VCs, as they can provide not only capital but also infrastructure, supply chains, and market access. Once the technology has been validated, the company can seek growth capital or green credit, paving the way for commercial scaling and long-term sustainable impact.

Table 18: Typical Capital Raising Ladder for Deeptech Startups in Viet Nam

Stage	Typical Funding Range	Main Funding Sources in Viet Nam	Startup Objectives	Investor Focus	Typical Dilution
Research & Ideation (Ideation / R&D Seed)	25.000 – 300.000 USD	Research grant programs (NAFOSTED, World Bank, BIRD), national innovation funds, universities and research institutes, technically oriented accelerators	Develop prototype, conduct lab testing, identify real-world applications, and secure initial IP protection	Technical capability, novelty and defensibility of technology, commitment of founding team	0–10%
Testing & Piloting (Pilot / Prototype)	200,000 – 1,000,000 USD	Technically skilled angel investors, AIS4EE / Startup Track programs, pilot collaboration projects with enterprises or ESCOs	Demonstrate stable technological performance in real-world settings, complete technical and performance documentation	Pilot results, implementation feasibility, letters of intent (LOI) from pilot partners	10–20%
Early Commercialization (Series A)	1 – 5 million USD	Deeptech-focused VC funds (Do Ventures, Ascend Vi-etnam Ventures, Touchstone Partners), corporate venture capital (CVC) in energy or industrial sectors, strategic ES-COs	Scale up production/installation capacity, deploy large-scale demonstration projects, secure first commercial contracts	Proven technology, clear business model, production capacity, customer pipeline	15–25%
Expansion & Growth (Series B and beyond)	5 – 20 million USD	Green growth funds, Climate Funds, energy infrastructure funds, development finance institutions (IFC, ADB), green credit banks	Scale production/installation, optimize costs, expand into regional markets	Stable cash flow, improving profit margins, strong management capacity, and sustainable impact	10–20%

5.2 Instrument deep-dives: Choosing the Right Type of Capital

Choosing the right funding instrument is as critical as finding the right investor. Different types of capital come with different costs, expectations, and suitability depending on your stage, business model, and growth plan. Viet Nameese startups, including those in the Energy Efficiency sector, have access to a range of options.

This section introduces four common types of funding instruments used by energy efficiency (EE) startups in Viet Nam and globally. Each includes a practical overview of what it is, when to use it, key pros and cons, and local examples to help you get started.

Use the “Funding Ladder” in Section 5.1 of Table 17 to determine your startup stage before exploring instrument types.

Grants & Prizes

Non-repayable funding awarded by donors, governments, development partners, or competitions. Often used to de-risk innovation or support early-stage pilots.

When to use it:

- Ideation or pre-seed phase
- R&D, prototyping, or feasibility studies
- Demonstration or impact driven projects

Local Examples:

- AIS4EE Prize Track (EU-GGGI-MOIT)
- EUDP (Denmark), ADB Innovation Grant
- Green Startups Fund (NATEC,

Pros:

- No dilution of equity
- Supports high-risk innovation
- Signals credibility to future funders

Cons:

- Competitive and time - consuming applications
- Delays in disbursement
- Limited scalability or follow-on funding

Angel & VC Equity

Investors provide capital in exchange for ownership (equity) in your company. Angel investors are individuals; VCs are professional firms managing pooled funds.

When to use it:

- Pre-seed to Series A stage
- To build your team, product, or go-to-market strategy
- When targeting high-growth scale-up

Local Examples:

- Angel networks: BANSEA, Vietnam Angel Network (VAN), and individual investors active in fintech, e-commerce, deeptech, etc.
- VC funds in Vietnam and the region: Expara Ventures, Do Ventures, VinaCapital Ventures, ThinkZone, Nextrans, Quest Ventures, 500 Global, Wavemaker Partners, among others.
- Startup accelerators and programs generating deal flow: Shark Tank Vietnam, Zone Startups, and various university or corporate accelerators.

Pros:

- Flexible funding range from small to large.
- Fast angel decisions; VCs provide strategic guidance, networks, hiring support.

Cons:

- Equity dilution.
- VC processes are long and demanding (due diligence, governance).
- Pressure to scale quickly to meet investor expectations.

Corporate/Strategic Investment

Corporations invest in startups that align with their long-term business goals—often through a Corporate Venture Capital (CVC) arm or strategic partnership..

When to use it:

- Post-seed stage when looking for scale
- If your solution complements a corporate value chain (e.g., logistics, EV, manufacturing)

Local Examples:

- VinFast Next100 Fund
- EVN SPC Innovation Program
- Becamex Ventures
- FPT Ventures, Viettel Innovation Lab

Pros:

- Strategic fit and potential market access
- Brand association and technical validation
- May offer longer investment horizons

Cons:

- May prioritize corporate interests
- Slower decision-making than traditional VC
- Potential IP or governance conflicts

Concessional & Green Loans

Debt instruments offered on favorable terms by green banks, development finance institutions (DFIs), or commercial banks with public guarantees.

When to use it:

- Seed to growth stages
- When there's some revenue and ability to repay
- To finance assets (e.g., solar PV, EMS, heat recovery systems)

Examples:

- BIDV Green Loan Program (with GCF)
- ADB Energy Efficiency Line
- IFC's Viet Nam Climate Finance Program
- VCB and TPBank green credit programs (with MOIT)

Pros:

- Non-dilutive capital
- Good for infrastructure/asset-heavy startups
- Builds creditworthiness

Cons:

- Requires collateral or creditworthiness
- Repayment pressure regardless of business success
- May not suit early-stage or high-risk startups

Founder's Tip:

Always balance cost of capital (ownership vs. repayment) with your company's risk profile and cash flow realities.

For early-stage EE startups, blended approaches (e.g., grant + angel + concessional loan) often work best.

5.3 Investor-readiness toolkit

Securing investment is not merely about having a groundbreaking idea; it is equally about meticulous preparation and demonstrating to potential investors that the startup is a credible and well-managed opportunity. Investor-readiness encompasses a range of activities, from refining the business plan and financial models to preparing compelling communication materials and anticipating the rigorous scrutiny of due diligence. This toolkit provides checklists, templates, valuation insights, a pitch deck outline, and an overview of common due diligence questions to help Viet Nameese founders prepare effectively.

5.3.1 Funding Preparation Checklists

Internal Readiness (Before Outreach) Before approaching potential investors, startups should ensure they are internally aligned and strategically prepared. The checklist below highlights key internal elements that should be addressed before initiating fundraising outreach

Table 19: Internal Factors to Strengthen Before Fundraising

Area	Key Questions
Business Plan	Is the plan focused on a specific, validated energy inefficiency problem? Does it align with national or industry sustainability goals
Financial Model	Are revenue, cost, and growth assumptions realistic and well explained ?
Intellectual Property	Are patents, copyrights, and trademarks registered or in process?
Investor Fit	Have investors been shortlisted based on their thesis and track record?
Team & Roles	Are roles and equity agreements clearly documented and aligned? (Does the team include energy domain experts/ partnerships with energy companies ?)

Market Validation	Is there credible traction from users, pilots, or partners?
Competitive Positioning	How does the EE solution compare in terms of cost-effectiveness, payback period, or ease of integration vs other technologies

Documentation for Investor Sharing: To build trust and streamline the due diligence process, startups should prepare a professional, complete, and investor-friendly set of materials. These documents should be organized into a virtual data room (VDR) or shareable digital folder (e.g., Google Drive, Dropbox) with clear file naming and logical structure. Below are the essential components with guidance on how to prepare them:

Table 20: List of Documents to Share with Investors

Document	Purpose	Guidance
Executive Summary (1–2 pages)	Provide a concise overview of your EE startup	Emphasize the energy-saving impact, environmental benefit (e.g., GHG reduction), market opportunity, team, and funding ask.
Pitch Deck (10–12 slides)	Visually communicate your business case to investors.	Follow a structured outline (see Section 5.3.3); keep it concise, engaging, and investor-focused. Emphasize metrics like energy saved, ROI, payback period.
Financial Projections (3–5 years)	Demonstrate revenue potential, cost structure, and capital needs.	Include assumptions on energy prices, adoption rate, rebates/subsidies, and projected savings for customers. Highlight cash flow break-even and funding runway.
Capitalization Table (Cap Table)	Show ownership distribution and potential dilution.	Provide a simple, updated table with all shareholders, share classes, and account for future impact of government grants or convertible notes common in cleantech.

Document	Purpose	Guidance
Key Contracts	Validate commercial traction and strategic partnerships.	Include ESCO agreements, government collaborations, utility partnerships, LOIs with pilot sites or vendor MoUs
IP Documentation	Protect proprietary EE tech or innovations	Include patent filings, trademarks, copyrights, and NDAs; explain any pending IP status.
Company Registration Docs	Confirm legal existence and structure of your business.	Provide certificate of incorporation, articles of association, business license, and related filings.
Product Specifications / Demo Access	Provide technical clarity and product credibility.	Include energy performance test results, dashboards for real-time monitoring, pilot case studies, and quantified energy savings reports.
Resumes of Founders & Key Team	Showcase the experience and strengths of your core team.	Highlight relevant expertise, past successes, and complementary roles aligned with EE business execution needs.
Market Research / Industry Data	Support your claims about market size, growth, and demand.	Provide credible sources, graphs, TAM/SAM/SOM estimates, and citations to industry reports or public data.

Key Templates (Conceptual Outline)

Investors review hundreds of proposals—your ability to communicate clearly, quickly, and persuasively can be the difference between securing a meeting or being passed over. While comprehensive templates can vary, it is essential to master the foundational structure of the two most commonly used investor-facing communication tools: the One-Page Executive Summary and the Elevator Pitch.

One-Page Executive Summary: This is often the first (and sometimes only) document an investor reads before deciding whether to engage further. It must be clear, concise, and compelling.

Table 21: One-Page Executive Summary

Section	Purpose & Guidance
Company Name & One-Liner	A short, sharp sentence summarizing what your startup does and its core value.
Problem	Clearly define the energy inefficiency, emissions issue, or operational waste that your solution targets. Quantify energy loss or cost if possible.
Solution	Explain your EE product or service and how it saves energy, reduces emissions, or lowers operating costs.
Target Market	Define your target segment (e.g., SMEs, industrial zones, public buildings) and its potential for energy-saving upgrades. Include market size, regulations, or policy incentives.
Team	Highlight your team’s experience in energy, engineering, sustainability, cleantech, or data science. Include relevant certifications (e.g., LEED, ISO 50001).
Traction/Milestones	Share energy savings data, pilot results, customer feedback, certifications, or strategic partnerships (e.g., utilities, government, industrial clients).
Business Model	Describe how you make money (e.g., SaaS, pay-per-use, subscription, licensing).
Funding Ask & Use of Funds	Specify how much you are raising and what the funds will be used for.
Contact Information	Provide email, phone number, and website or LinkedIn.

Tip: Use bullet points and short paragraphs. Keep to one page. Use simple language and clear headings.

Elevator Pitch (60 seconds): An elevator pitch is a verbal snapshot of your business that you can deliver in a minute or less. It's useful at networking events, pitch competitions, or investor intros.

Step	What to Say
Hook/Problem	Start with a strong, specific problem related to energy inefficiency. Make it relatable to your target audience.
Your Solution	Briefly explain your product or service and what makes it unique.
Value Proposition	Summarize the core benefit for your customer. Focus on measurable outcomes like energy savings, cost reduction, emissions reduction, or operational efficiency.
Traction/Credibility	Share real evidence of progress: pilot projects, savings achieved, users served, strategic partnerships, awards, or testimonials.
The Ask	Finish with a clear ask: how much funding or support you're looking for, how it will be used, and what your next goal is

Tip: Practice until it feels natural. Avoid jargon. Focus on clarity, confidence, and enthusiasm.

5.3.2. Valuation Quick-Math / Common Methods for Early-Stage Startups

Valuing an early-stage startup is less about formulas and more about expectations, negotiation, and context. Most early ventures lack stable revenues, profits, or hard assets—making traditional valuation models difficult to apply.

However, founders still need to understand key methods and be prepared for valuation discussions with potential investors. This section outlines the most widely used approaches and how they apply in practice.

Table 22: Common Valuation Methods

Method	What It Is	Usefulness for EE Startups
Comparable Company Analysis	Looks at recent valuations of similar startups in the same sector, stage, and market.	Good for benchmarking—but tricky if there are few relevant local deals.
Cost-to-Duplicate	Estimates how much it would cost to build the same startup (tech, team, IP) from scratch.	Offers a “floor” valuation but ignores brand, traction, or future potential.
Discounted Cash Flow (DCF)	Projects future cash flows and discounts them to present value using a risk-adjusted rate.	Rarely used at early stage due to high uncertainty in revenue and growth projections.
Berkus Method	Assigns value to five qualitative factors: idea, prototype, team, strategic partnerships, and early traction (each worth up to ~\$500k).	Great for pre-revenue stages; simple and practical. Focuses on potential and risk reduction.
Scorecard Method	Starts with average local startup valuations and adjusts up/down based on team, product, market, and competition via weighted scorecard.	Useful for local investors who want a structured, risk-based approach.
Venture Capital Method	Estimates future exit value, then works backward to determine today’s value based on target returns (e.g., 10x–30x).	Common in VC deals; forces founders to justify exit assumptions and scale potential.
Reverse Engineering Approach	Back-calculates valuation from the funding amount and target ownership (e.g., \$500k for 20% implies a \$2.5M post-money valuation).	Simple and often used in practice—especially in Viet Nam.

**Example: Valuation Using the VC Method – Case of Eco-Optima Vietnam
(Company background used for illustrative purposes only)**

a) Background: Eco-Optima is a Vietnamese deep-tech energy-efficiency startup developing an AI-based Building Energy Management System (BEMS) platform that optimizes HVAC and lighting systems for large commercial buildings.

b) Fundraising objective: Eco-Optima is seeking USD 1,000,000 in its Seed Round to scale from its pilot project to deployment across 20 commercial buildings in Ho Chi Minh City.

c) Exit plan: The founders and venture capital investors expect to exit via an IPO⁶³ after 5 years.

d) VC's target return: As a deep-tech startup at an early and high-risk stage, the VC requires a target IRR⁶⁴ of 50%.

e) Key financial assumptions (after 5 years):

- Projected net income in Year 5: Eco-Optima is expected to reach USD 2,000,000 in net profit by the end of Year 5.
- Target Price-to-Earnings (P/E) multiple at exit: Based on comparable clean-tech M&A transactions in the region, both the VC⁶⁵ and the founders agree to apply a 15× P/E multiple.
- Capital structure assumption: After the Seed Round, Eco-Optima will not raise additional capital nor issue more shares.

63 IPO (Initial Public Offering) is the first sale of a company's shares to the public, allowing the business to raise capital by listing its stock on a securities exchange.

64 IRR (Internal Rate of Return) is the annualized rate of return at which the net present value (NPV) of an investment equals zero, representing the investor's expected yearly return.

65 <https://cmavietnam.substack.com/p/venture-capital-valuation-method>

Assumption		Notes	Formula
Investment Amount / Fundraising Target	\$ 1,000,000.00	F	
Investment Holding Period (Years)	5	G	
Venture Capital Method (VCM) Calculations			
Terminal value ⁶⁶ of the Company at IPO Year	\$ 30,000,000.00	I	B*C
Target Return Multiple ⁶⁷	7.59x	J	(1+E)^G
Present Value ⁶⁸ of the Company at Year of Investment	\$ 3,950,617.28	K	I/J
Required Future Value of the Investment ⁶⁹	\$ 7,593,750.00	L	F*J
Ownership required by the VC to achieve expected return	25%	M	L/I
Target return multiple expected by the VC on its investment	7.59x	N	L/F

66 Terminal value is the estimated value of a business at the end of the forecast period, representing the remaining value of all future cash flows beyond the detailed projection horizon.

67 Multiple refers to the investor's expected return ratio, calculated as the total exit proceeds divided by the initial investment amount.

68 Present value is the current value of the future cash flows generated by the company, obtained by discounting those cash flows back to today using a required rate of return.

69 Required future value of investment (FV) is the future amount that the investment must grow to, based on the initial capital invested and the investor's target rate of return.

Valuation Summary			
Investor ownership after investment	25%	O	sum(M)
Founder ownership	75%	P	1-O
Post-money valuation	\$ 3,950,617.28	Q	K
Pre-money valuation	\$ 2,950,617.28	R	Q-F

Quick Insight: What Early-Stage Investors Actually Look At

In early rounds (pre-seed to Series A), qualitative factors often matter more than financial metrics:

- Team: Do they have the passion, experience, and cohesion to execute?
- Problem & Solution: Is the problem real and large? Is the solution compelling?
- Market Size: Is there enough upside if the idea works?
- Traction: Any users, pilots, or paying customers yet?
- Technology/IP: Is it defensible or unique?
- Vision: Is there a big story and long-term roadmap?

Founder's tip:

Avoid chasing overly high valuations in the early stages, as this can backfire if your company fails to achieve key milestones as expected. Instead, focus on clearly defining your core value proposition, even if you haven't yet generated revenue. Referencing local benchmarks, especially recent deals in Vietnam's energy startup ecosystem, can help position your company more realistically in the eyes of investors. Building credibility is crucial – even early achievements such as pilot projects, awards, or strategic partnerships can provide a significant advantage during negotiations.

5.3.3 Standard Pitch-Deck Outline

A well-crafted pitch deck⁷⁰ is a core tool that enables founders to effectively communicate their vision, technology, and business plan to investors. However, the way content is structured differs significantly between SaaS startups and Deeptech/hardware startups. For SaaS ventures, investors tend to focus on user growth rate, scalability, and recurring revenue metrics. In contrast, Deeptech investors emphasize technological depth, pilot evidence, and post-R&D commercialization strategy. Below is a practical outline of a standard pitch deck (10–12 slides), which can be customized for both startup types.

Table 23: Standard Pitch-Deck Outline

Slide	Content Overview	Presentation Tips (SaaS / Deeptech)
1. Cover Slide	Company name, logo, tagline, and a short sentence defining your mission.	Keep it concise and inspiring. For Deeptech, add a brief line describing the core technology.
2. Problem	Describe the major problem, who is affected, and why current solutions are ineffective.	Convey emotion and urgency. For Deeptech, highlight the “technical pain point” or current technological limitations.
3. Solution	Present your product/service and explain how it addresses the problem.	SaaS: emphasize user experience, performance, and cost-efficiency. Deeptech: highlight core technology, operating principle, and technical advantages.
4. Why Now?	Explain why this is the right time — technological trends, policies, user behaviors, or market disruptions.	SaaS: cite digital adoption or consumer trends. Deeptech: link to energy, ESG, or innovation policies.
5. Market Opportunity	TAM, SAM, SOM — market size, growth rate, and opportunity gaps.	Use credible data sources. Deeptech can segment by application or vertical industry.

⁷⁰ Pitch deck is a concise presentation (typically 10–20 slides) used to provide investors with an overview of a business or project, covering the market problem, solution, business model, funding needs, and founding team.

Slide	Content Overview	Presentation Tips (SaaS / Deeptech)
7. Traction / Milestones	Highlight achievements — users, revenue, partners, test data, technical certifications, or awards.	SaaS: emphasize growth metrics. Deeptech: stress pilot success, LOIs, and performance validation.
8. Business Model	Explain how you generate revenue, pricing structure, and distribution channels.	SaaS: subscription or usage-based models. Deeptech: equipment sales, licensing, ESCO, or project contracts.
9. Team	Introduce founders and advisors; emphasize technical and operational expertise.	SaaS: focus on growth and operations. Deeptech: emphasize R&D background and industry experience.
10. Competition / Alternatives	List competitors, and describe differentiation and competitive advantage.	SaaS: UX, technology, cost. Deeptech: performance, patents, technical barriers.
11. Financial Projections	3–5-year outlook — revenue, costs, profit margins, and capital requirements.	SaaS: customer growth model. Deeptech: R&D timeline, testing costs, and breakeven point.
12. Investment Ask	State how much funding is sought, how it will be used, and the milestones expected in 12–18 months.	Clearly link each capital use to milestones (MVP, pilot, revenue).
13. Vision / Roadmap	Present 5–10-year direction, market expansion, and social impact.	SaaS: geographic or product expansion. Deeptech: technology roadmap and global commercialization readiness.

14. Contact Slide

Include name, title, email, website, and LinkedIn.

Add QR codes or meeting links. For Deeptech, you may include lab or technical contact details.

Founder's Tip:

Localize your message: Show understanding of Viet Nam's regulatory landscape, customer behavior, and market gaps.

Avoid overloading slides: Each slide should make one clear point.

Use visuals: Charts, product shots, and user stories are more powerful than blocks of text.

Tailor your pitch: A pitch for a government-backed green fund will differ from one aimed at a private VC.

5.3.4 Common Due diligence Questions

Due diligence is a comprehensive assessment process that investors use to evaluate a startup before making an investment decision. It verifies whether the business is well-managed, legally sound, financially viable, and aligned with the investor's expectations. Being well-prepared can significantly increase your chances of success and speed up the funding process.

Founders should prepare answers and organize key documents around the following six due diligence categories. Consider setting up a secure shared folder with labeled subfolders—for easy investor access.

1. Team

- Who are the founders, shareholders, and key personnel?
- What motivates the founding team and how committed are they long-term?
- What relevant experience and domain knowledge does each team member bring?
- How are responsibilities divided and how are decisions made?
- Are there plans for future hiring?
- Are there any skill gaps in the current team?

2. Product and Technology

- What specific customer problem does the product or service solve?
- What is the unique value proposition or differentiation?
- What is the current development stage (MVP, beta, full launch)?
- Is the tech architecture scalable? What's the current tech stack?
- Is the product backed by proprietary IP or patents?
- What is the roadmap for future product development?
- How is the codebase maintained? Is there technical debt?
- What processes are in place for testing, security, and DevOps?

3. Market and Competition

- What is the size of the Total Addressable Market (TAM), SAM, and SOM?
- Who is your target customer and what is their profile?
- Who are the main competitors (direct and indirect)?
- What are your startup's key advantages or moats?
- How will you acquire and retain customers (go-to-market strategy)?
- What are the key market trends and regulatory tailwinds (especially for EE)?

4. Business Model and Financials

- How does the startup generate revenue? What is your pricing model?
- What are the key unit economics (CAC, LTV, gross margin)?
- Do you have any historical financials (even pre-revenue data)?
- What are your projected financials (next 3–5 years)?
- What are the assumptions behind these projections?
- How much funding are you seeking and how will it be used?
- What are your current burn rate and runway?
- What are your major financial milestones and KPIs?

5. Legal and Corporate Structure

- What is your legal structure (LLC, JSC, etc.)? Provide articles of incorporation.
- Who owns what (shareholding and cap table)?
- Are there any existing investor/shareholder agreements?
- Are all IP rights secured under the company name?
- Are there any major contracts (e.g., with clients, vendors, or partners)?
- Are you compliant with Viet Namese laws (data, tax, labor, environmental, etc.)?
- Are there any legal disputes or potential liabilities?

6. Exit Strategy

- What are the envisioned exit paths (M&A, IPO, strategic buyout)?
- Who are the most likely acquirers or strategic partners?
- Is your team aligned on exit timelines and investor expectations

Founder's Tips:

- *Prepare Early: Anticipate investor questions and organize key documents in a well-structured virtual data room.*
- *Be Transparent: Honest, timely, and consistent communication builds trust and accelerates the process.*
- *Stay Responsive: Prompt replies to investor queries signal professionalism and readiness.*
- *Technical Startups: Be Thorough: For tech ventures, expect deeper dives into your architecture, scalability, codebase quality, and cybersecurity practices.*
- *Local Context Matters: In Viet Nam, be ready to explain how your startup aligns with local regulations, adapts to the domestic market, and manages relationships with key stakeholders.*

5.4 Closing the deal & post-investment

Successfully raising capital is not the end of the fundraising journey, it's the beginning of a new phase. This section guides founders through the essentials of finalizing investment agreements and building a strong post-investment relationship with investors.

5.4.1. Understanding the Term-Sheet

After securing investor interest, the next major milestone is negotiating and signing a term sheet—a short, typically non-binding document that outlines the key terms of the investment. It sets the foundation for the legally binding investment agreements to follow and helps align expectations between founders and investors from the outset.

Understanding the term sheet is crucial for safeguarding your startup's future and negotiating terms that enable long-term growth, not just short-term funding

Table 24: Common Terms in a Venture Capital (VC) Term Sheet

Clause	What It Means	What to Watch For
Valuation (Pre-money & Post-money)	The company's value before and after the investment.	Impacts how much equity you're giving away. Negotiate based on realistic traction and market benchmarks.
Investment Amount	Total capital the investor agrees to inject.	Ensure this amount aligns with your capital needs and projected milestones.
Type of Security	The type of equity issued—often preferred shares.	Preferred shares come with extra rights. Understand what they are and how they affect control.
Liquidation Preference	Who gets paid first in a liquidity event.	"1x non-participating" is common and founder-friendly. Be cautious of "participating preferred" with high multipliers.
Founder Vesting	Schedule over which founders earn their shares.	A standard is 4 years with a 1-year cliff. Ensure fairness and alignment with future co-founder commitment.
Board Composition	Structure of your board and who appoints members.	Too many investor seats may reduce founder control. Aim for balance.
Protective Provisions	List of decisions requiring investor consent.	Includes major actions like issuing new shares or selling the company. Negotiate to avoid excessive restrictions.

Information Rights	Investors' right to receive reports and updates.	Standard, but be clear about frequency and scope.
Pro-Rata Rights	Right of existing investors to join future rounds.	Reasonable, but check that it doesn't crowd out new investors.
Anti-Dilution	Protects investors from share dilution in future down rounds.	Favor "broad-based weighted average" over "full ratchet" for fairness.

Founder's Tips:

A term sheet is often structured in favor of investors, but founders can and should negotiate several key clauses. Focus on four critical areas. First, valuation, as it determines the share of equity you will give up—do not underestimate your company's potential and growth momentum. Second, liquidation preference—avoid unfavorable terms such as high liquidation multiples or participating preferred clauses that can significantly reduce your return at exit. Third, board control and protective provisions, since excessive investor control may slow down decision-making; aim for a balanced and collaborative structure. Fourth, founder vesting, which should reflect fair commitment within the founding team, especially when there are multiple co-founders.

To protect your long-term interests, work with a lawyer who understands startups and has experience with venture capital transactions. Not every clause needs to be fought over, but identifying and focusing on the truly critical points is key to successful negotiation.

5.4.2. Board Rights & Governance

After securing investment—particularly through a priced equity round—startups typically enter into a new phase of governance. Investors often seek formal or informal oversight rights to protect their interests and support the company's growth. Founders must understand the implications of these governance structures and set them up with care.

Common Forms of Investor Involvement:

- **Investor Board Seats:** Most venture capital (VC) term sheets include provisions for investor representation on the board of directors. These board members have fiduciary duties to all shareholders—not just to their VC fund—and play a strategic advisory role
- **Observer Rights:** In some cases, investors may not take a board seat but request observer status—allowing them to attend board meetings and receive board materials, but without voting power. This gives visibility without governance influence.

Tips:

Maintain a manageable board size and ensure the presence of independent voices if possible.

- **Protective Provisions:** These are veto rights that investors negotiate to safeguard key interests. Examples include approval rights over issuing new shares, major acquisitions, changes in company structure, or alterations to the board composition

Founder's Tip:

These clauses can limit operational flexibility, so it's crucial to understand and selectively negotiate them.

Establishing Good Governance from the Start: Strong governance doesn't just protect investors—it builds trust and resilience within the startup. Key practices include:

- **Regular Board Meetings:** Schedule quarterly or bi-monthly meetings with clear agendas and pre-distributed materials.
- **Transparent Financial Reporting:** Share concise updates with KPIs, cash flow position, and strategic risks.
- **Clear Roles and Responsibilities:** Ensure the board's role complements—not replaces—founder decision-making.
- **Legal and Ethical Compliance:** Follow national laws, industry regulations, and ethical standards; this is especially important for EE startups operating in regulated sectors.

Tips:

View Your Board as a Strategic Ally - a productive, trust-based board relationship can accelerate your startup's growth and help secure future rounds of investment.

5.4.3. Reporting Duties to Investors

Once the deal is closed, investor reporting becomes a critical part of the post-investment relationship. It's not just about sharing numbers—it's about building trust, demonstrating progress, and showing that the startup is executing its vision responsibly. Well-prepared reports can secure investor confidence, unlock follow-on funding, and draw valuable strategic support.

Reporting Frequency:

- Typically agreed upon in investment agreements
- Common schedules: Monthly for early-stage startups or Quarterly for growth-stage companies
- Ad-hoc updates may be needed when milestones are achieved or challenges arise

Key Components of Investor Reports:

Table 25: Key Components of Investor Reports

Section	Purpose & Tips
1. Executive Summary	Summarize wins, setbacks, and next steps—1–2 paragraphs max. Think like a CEO briefing the board.
2. KPIs / Traction	Present core metrics. These should be consistent across reports. For EE startups, consider: - Customer Acquisition Cost (CAC) - Lifetime Value (LTV) - Retention / Churn Rates - MRR/ARR (for SaaS) - Energy saved / CO2 reduced
3. Financial Summary	Report revenue, expenses, gross & net margins, cash balance, burn rate, and runway. Include variance vs. plan.
4. Milestone Progress	Track progress against goals from your pitch deck or last update. Show which milestones are ahead, on track, or delayed.
5. Fundraising Update	If relevant, indicate upcoming rounds, target raise amount, timeline, and current conversations.

6. Market Intelligence	Provide concise updates on competitor moves, policy changes, customer feedback, or sector trends.
7. Team Update	Highlight new hires, key departures, or upcoming recruitment plans.
8. Risk & Mitigation	Share risks honestly. Demonstrate how you're managing them. This builds trust.
9. Use of Funds	Break down how the capital is being spent vs. the plan presented in the fundraising round.

Table 26: Best Practices for Investor Reporting

Best Practice	What It Means
Transparency	Share both good news and bad news. Investors value honesty more than perfection.
Consistency	Use the same format and KPIs each time. This helps investors track performance over time.
Proactive Communication	Don't wait to be asked. Send reports on time. Share urgent issues immediately.
Clarity & Conciseness	Avoid jargon. Use visuals (charts, tables) where helpful. Keep each report to 3–5 pages max.
Forward-Looking Updates	Include a short section on what's coming next—strategy shifts, upcoming product launches, etc.

Tips:

In addition to business metrics, investors in the energy sector often value impact metrics—such as energy efficiency gains, emissions avoided, or policy alignment. Tracking these from the beginning strengthens both your fundraising story and your ESG credentials.

5.4.4. Tips to Keep Investors Engaged & Supportive

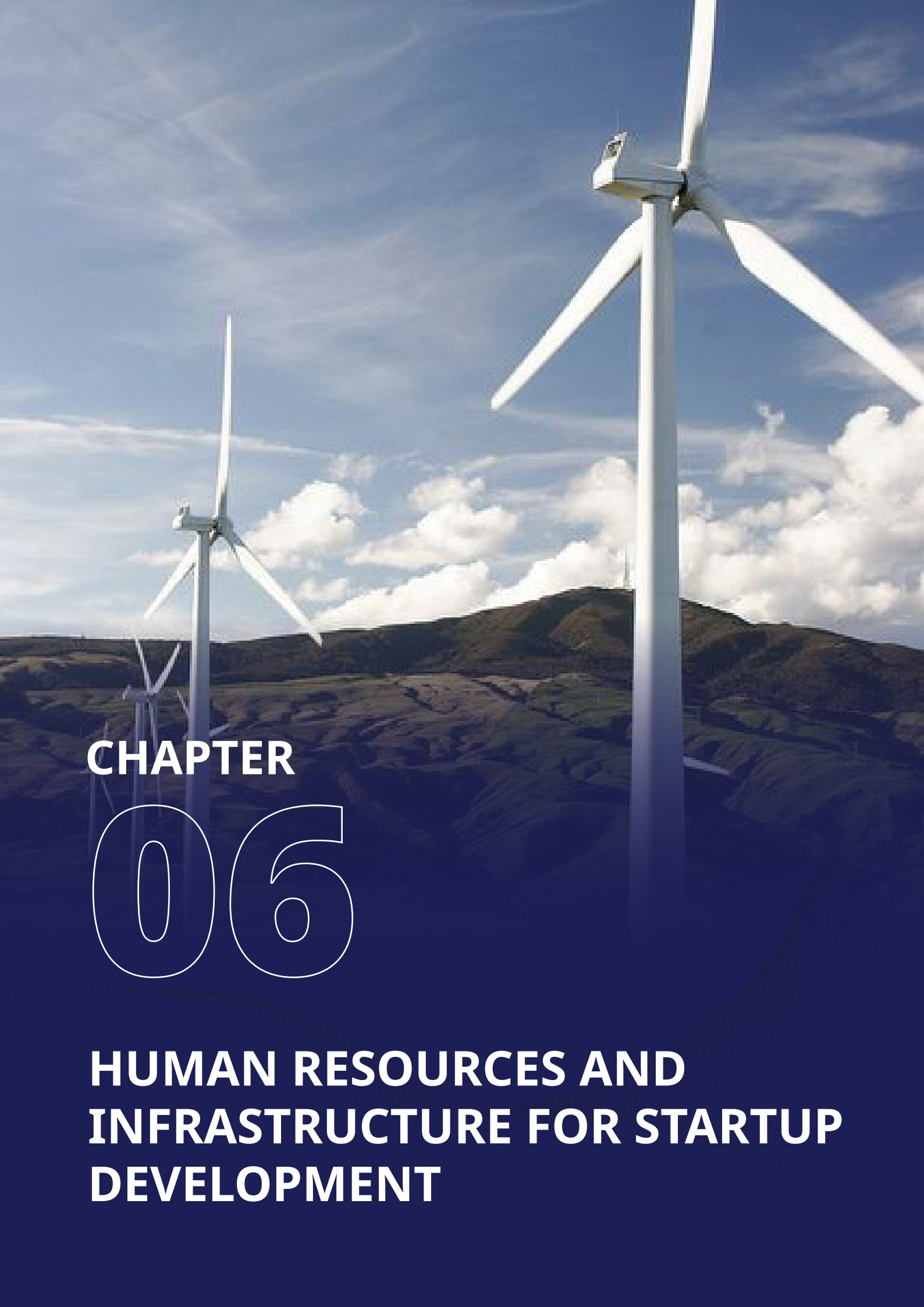
Securing funding is just the beginning. Smart founders know that nurturing relationships with investors post-deal can unlock more than capital—such as expertise, networks, and follow-on support. Here are practical ways to transform your investors into long-term champions of your energy efficiency startup.

Table 27: Strategies for Maintaining Investor Engagement

Tip	Why It Matters / How to Do It
Seek Advice, Not Just Money	Investors have deep experience. Ask for input on strategic decisions, market timing, partnerships, or recruitment.
Send Informal Updates	Don't wait for the next report. A quick email on a pilot success or challenge shows you're transparent and proactive.
Leverage Their Network	Ask for introductions—to corporate partners, new customers, or co-investors. Investors are often well-connected across sectors.
Be Transparent & Responsive	Respond quickly to questions or requests. Candor builds trust—especially when things go wrong.
Follow Through on Promises	Consistent progress builds your credibility. Always update investors on milestone achievements.
Include Them in Events	Invite them to product demos, launch events, or panel discussions. Seeing traction builds engagement.
Understand Their Constraints	Investors report to LPs. They care about portfolio risk and timelines. Tailor updates to show how you manage both.

Founder's Tip:

Treat investors like strategic advisors, not just funders. The stronger your relationship, the more likely they'll go the extra mile—whether it's helping you close a critical hire, unlocking a key corporate account, or advocating for you in the next round.

A photograph of a wind farm with several white wind turbines on a grassy hill under a blue sky with scattered white clouds. The image is used as a background for the chapter title page.

CHAPTER

06

**HUMAN RESOURCES AND
INFRASTRUCTURE FOR STARTUP
DEVELOPMENT**



CHAPTER 6. HUMAN RESOURCES AND INFRASTRUCTURE FOR STARTUP DEVELOPMENT

In the journey from idea to impact, the strength of an energy efficiency (EE) startup depends not just on the innovation itself, but on the people and systems behind it. A brilliant concept can falter without the right team to execute it—or without access to facilities that enable testing, iteration, and validation. For early-stage EE ventures, building a capable team that can secure enabling infrastructure is not a secondary concern; it is a foundational requirement.

Human capital is essential for navigating the multidisciplinary nature of innovation in the energy efficiency sector. Teams must combine technical know-how (engineering, energy auditing, digital systems) with business skills (project management, sales, finance) to bring viable solutions to market. At the same time, access to infrastructure—labs, testing equipment, maker spaces, and innovation hubs—can significantly shorten product development cycles and improve credibility with partners, investors, and regulators.

These needs are even more pressing in the EE sector, where solutions must meet performance standards, regulatory requirements, and real-world energy savings benchmarks. Without proper infrastructure and expert input, many startups struggle to validate their technology or build trust with customers.

This chapter highlights why investing in talent and infrastructure from the outset is crucial to building scalable, resilient EE ventures. It provides actionable guidance for founders on how to:

- Recruit and retain the right people;
- Identify and access key facilities;
- Leverage partnerships with universities, labs, and public innovation hubs;
- Assess and improve organizational readiness for growth.

By treating human resources and infrastructure as strategic assets EE startups can position themselves for faster learning, higher-quality outputs, and greater long-term impact.

Before diving into the following sections, it's essential to distinguish between a hardware startup and a software startup. Understanding their differences will allow for deeper and more accurate analysis in the later parts:

Aspect	Software Startup	Hardware Startup	Recommended Strategy
1. Core Team Structure	Small and agile; includes software engineers, UX/UI designers, and product managers.	Cross-functional; requires electronics, mechanical, firmware, and manufacturing engineers.	Keep the technical team lean; outsource or partner for non-core functions (design, QA, manufacturing).
2. Role of Co-founders	CTO oversees technology; Growth lead handles product and customers.	Includes design engineers, manufacturing experts, and commercialization leads.	Choose co-founders with complementary skills (one technical – one business-oriented).
3. Team Development Stage	2–3 members in early stage, expanding post-MVP.	Requires larger team early on to build prototypes and supply chains.	Focus on core hires first, then outsource as product viability increases.
4. Key Skill Sets	Programming, UX/UI, digital marketing, data analytics.	Mechanical design, electronics, testing, logistics.	Regularly assess skill maps; add new capabilities as you move through stages.
5. Hiring & Training Speed	Fast hiring, flexible training, remote-friendly.	Slow hiring, requires hands-on and specialized training.	Use internal mentors; for hardware, develop project-specific training processes.
6. External Dependency	Low – mostly in-house development.	High – dependent on component suppliers, factories, and testing labs.	Build a trusted partner network (vendors, labs, factories) early to reduce supply chain risks.
7. Work Culture	Fast-paced, flexible, often using Agile/Scrum.	Disciplined, process-driven, technically oriented.	Foster a culture of “learning fast but with precision”; separate R&D from production teams.
8. Team Management Tools	Jira, GitHub, Notion, Slack.	PLM, CAD, ERP, manufacturing management systems.	Use tools suited to your stage: Agile tools for ideation, PLM for production phases.

Aspect	Software Startup	Hardware Startup	Recommended Strategy
9. Talent Acquisition & Retention	Attract through creativity, startup culture, and rapid learning.	Attract through ownership of IP and opportunities to build tangible products.	Create career growth paths and milestone-based incentives.
10. Team Growth Plan	CTO oversees technology; Growth lead handles product and customers.	Expands by production capacity and market size (slower scaling).	Forecast hiring needs by milestones (MVP -> Pilot -> Scale-up).
11. Equity & ESOP⁷¹	Easier to apply, flexible vesting schedules.	More complex, requires long-term commitment.	Design a 3–4 year ESOP tied to technical or production milestones.
12. Key Challenges	Talent loss due to competitive IT sector.	Hard to find cross-disciplinary engineers; long R&D cycles.	Build a retention culture: transparency, recognition, and early profit-sharing.

6.1 Building & Developing a Team

Success in any entrepreneurship starts with people, not just products. Whether you're building a retrofit solution, developing smart control software, or launching a new ESCO model, having the right mix of skills on your team will make or break your startup's progress.

This section will help you identify who you need, where to find them, and how to build a team that grows with you.

⁷¹ ESOP (Employee Stock Ownership Plan) is an employee equity program that allows staff to purchase or receive company shares, aligning their personal incentives with the company's performance and strengthening motivation and retention.

⁷² Vesting is the process through which employees gradually earn actual ownership of shares or stock options (ESOP) over time or upon meeting performance milestones, typically designed to encourage long-term commitment to the company.

6.1.1 Who Do You Need on Your Team?

Most EE startups require a balanced team across three functional areas:

Team Area	Typical Roles
Technical	Energy auditor, hardware engineer, IoT developer, software programmer
Business & Strategy	Product manager, sales lead, marketing & customer outreach, business developer
Operations & Support	Finance officer, legal/compliance advisor, admin/HR coordinator

Founders Tip: You don't need a full team from day one—but you do need a clear map of the skills required to build, test, and sell your solution.

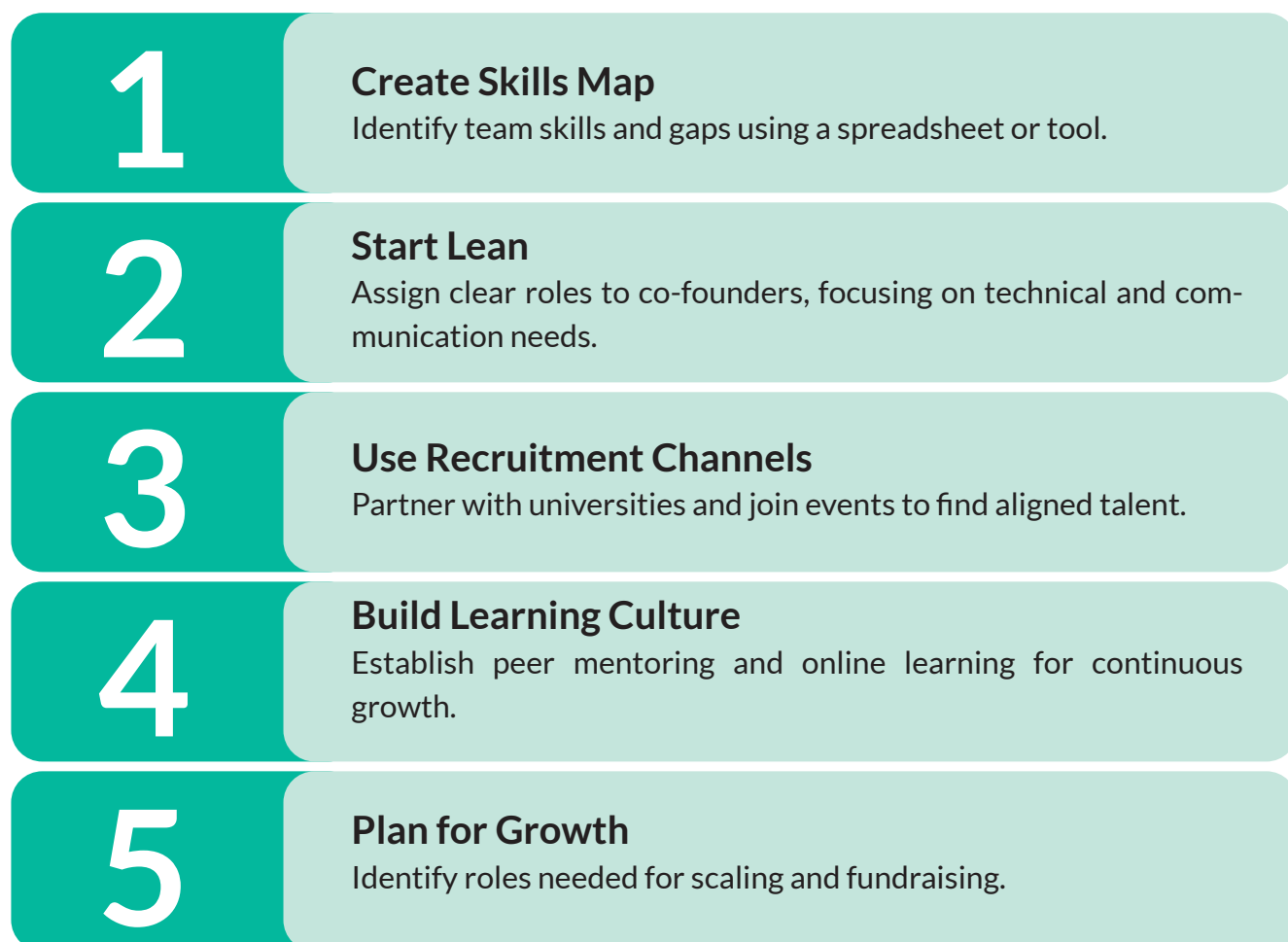


Figure 15: Step-by-Step: How to Build Your Core Team

Step 1. Create a Skills Map

Startups often underestimate how important it is to visualize their team’s capabilities. Use a simple spreadsheet or the Competency Map Tool to create a snapshot of your team’s skills.

How to do it:

Step	What to Include
List key functions	e.g., energy audit, IoT integration, sales, operations
Define required skills	technical know-how, project management, stakeholder engagement
Assess current team	Who has what skills? What’s their proficiency level?
Identify gaps	What key roles or skills are missing or overburdened?

This map becomes your **recruitment and training guide**.

2. Start Lean – But Intentionally

Early-stage EE startups usually can’t afford large teams. That’s okay—but you still need clarity in roles and strategic balance in your team composition.

Tips:

- One co-founder should be fully responsible for product or technology.
- Another should focus on the business side—customer interviews, partnership building, fundraising.
- Document role responsibilities, even if they overlap. It reduces friction as you grow.
- Use tools like Trello, Notion, or Google Sheets to manage task ownership transparently.

3. Use Recruitment Channels

You don't need expensive recruiters. Viet Nam offers rich, untapped talent pools in universities and innovation hubs.

Effective recruitment strategies:

- Partner with engineering and business schools (e.g., HUST, HCMUT) for interns or capstone project collaborations.
- Tap into innovation hubs like NIC, SIHUB, BK-HUB—many run talent programs or startup matching.
- Attend clean-tech hackathons or pitch competitions to meet mission-aligned talent.
- Post on niche platforms like TopCV, Viet NamWorks Green Jobs, or international climate startup groups on LinkedIn.

Tip: Clearly define what makes your startup exciting—mission, learning opportunity, or real-world impact. Talented young professionals want meaningful work.

4. Build a Learning Culture from Day One

Even with a small team, continuous learning sets you apart. Energy efficiency spans many domains (policy, digital tools, user behavior)—so your team must adapt.

Suggestions:

- Schedule monthly peer learning sessions (e.g., tech lead shares on ISO 50001 or energy audits).
- Encourage low-cost, high-impact online courses (e.g., Coursera, Udemy, ADB's green energy platforms).
- Set individual learning goals and include them in performance reviews.
- Invite mentors or guest speakers for lunch talks from your extended network or alumni.

Tip: Startups that prioritize learning tend to retain talent longer and pivot faster.

5. Plan for Growth

You may start lean, but rapid growth can overwhelm unprepared teams. Anticipate hiring needs early—especially if you're fundraising or starting pilots in multiple locations.

Key questions to guide you:

- Which roles are mission-critical if we scale to 10x users?
- Are our current team members overstretched?
- Which hires would allow founders to step back from day-to-day operations?
- Are we prepared to attract and retain senior talent (e.g., offer Employee Stock Ownership Plan ESOP or flexible work)?

Tip: Build a basic hiring roadmap linked to your business plan: e.g., "Hire field engineer by Q4 2025 to support southern pilot."

6.1.2 Guidance for Early-Stage Startups

Building your core team, early-stage founders should consider a few key areas that can make or break long-term success:

Hiring Priorities Aligned with Startup Growth Phases:

Hiring priorities for startups should evolve in line with each phase of growth, ensuring that the right talent is brought on board at the right time.

- In the validation phase, the focus should be on building a lean and versatile core team, typically composed of founders and perhaps one or two early hires. Key roles at this stage include a technical co-founder or engineer to develop and iterate the minimum viable product (MVP), and a business or operations lead to handle customer discovery, partnerships, and basic sales.
- As the startup moves into the early traction phase and begins to achieve product-market fit, it becomes important to add functional specialists such as a product manager, growth marketer, customer support, and a finance or admin coordinator. These hires bring deeper expertise to address specific bottlenecks and help refine the product and user experience.
- Once the company enters the scaling phase, the hiring strategy should shift toward building out full teams for each function, bringing in experienced professionals to lead departments like sales, engineering, HR, and customer success. At this stage, structured onboarding, clear job descriptions, and scalable hiring processes become essential to support rapid growth and ensure that every new team member contributes effectively to the company's long-term success.

Early-Stage Equity and Compensation:

Offering equity is a practical way for early-stage startups to attract and keep talented team members when cash are limited. It's common for founders to split equity based on each person's role, time commitment, and unique contributions such as one founder handling technology and another focusing on business development. Early hires, like the first engineer or sales lead, might receive a small percentage of equity that vests over several years, encouraging them to stay and contribute to the company's growth. Being open about how and when equity is earned helps set clear expectations and builds trust within the team. In many cases, startups work with local legal advisors to ensure their equity agreements are fair and motivating for everyone involved.

Case sample: Parker, Leslie, and Terry⁷⁴ worked together to launch a startup based on an app idea. Parker came up with the initial concept and contributed some early sketches, but spent less than 10% of the total hours invested. Leslie, the programmer, put in the

74 Berry, T. (2015, March 2). A case study on startup equity. Planning, Startups, Stories. <https://timberly.bplans.com/a-case-study-on-startup-equity/>

most work, developing the prototype and solving technical challenges. Terry joined later, wrote the business plan, and started networking to find investors. When it came time to divide equity before seeking outside funding, they looked at each person's actual contributions:

- Parker, as the original idea person but with limited ongoing involvement, was allocated 10% of the founders' shares.
- Leslie, who did the bulk of the technical work, received 50%.
- Terry, who led the business side, got 40%.

This split reflected not just the idea, but the time, effort, and value each person brought to turning the idea into a real business. The case highlights the importance of being honest about contributions and responsibilities when dividing equity in a startup.

- Setting up a board of advisors or directors when outside capital is raised.
- Clarifying reporting lines and decision rights as the team grows.
- Updating legal, compliance, and risk management processes when launching new products or expanding geographically.

Proactively addressing these governance milestones helps maintain accountability, supports investor confidence, and ensures the startup is prepared for sustainable growth.

Table 28: Quick Self-Check: Is Your Team Ready?

Question	Yes	No	Notes
Have you identified the core roles needed for your startup phase?	☐	☐	E.g. Do you have tech + business + operations covered?
Are roles and responsibilities clearly defined?	☐	☐	Even between co-founders—write them down.
Have you planned how to address current skill gaps?	☐	☐	Through hiring, upskilling, or partnerships.
Do team members have opportunities to grow professionally?	☐	☐	Motivation and retention matter.

Are you building a team culture that supports innovation and resilience?	☐	☐	It's not just what you build—it's who you build it with.
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Founder's Tip:

"Hire for mindset, train for skill." A junior engineer who's adaptable and mission-driven may outperform an expert who's disengaged.

Internships work – especially when paired with real responsibility and mentorship.

Your team is your story. Investors want to know: "Why can this team solve this problem better than anyone else."

6.2. Infrastructure for Scaling

Access to the right infrastructure is a key enabler for EE startups. Infrastructure here refers not only to office space, but also to technical facilities, testing platforms, pilot environments, and digital systems that support product validation, R&D, deployment, and scale-up.

6.2.1 Testing & Validation Infrastructure:

Most EE solutions require proof of performance before being adopted by industrial or commercial clients. Startups should look to external labs or platforms to test, measure, and certify their solutions.

Table 29: Examples of EE-relevant infrastructure

Type of Facility	Use for EE Startups	Examples in Viet Nam
Electrical load testing labs	Verify energy savings of devices under various loads	HCMUT Energy Lab, VNEEP-accredited labs
Thermal performance testing facilities	Assess insulation, HVAC efficiency, and heat loss	Institute of Energy Science (IES), provincial DoIT labs
Smart grid simulation labs	Model load response, grid integration of EE tech	Hanoi University of Science & Technology (HUST)

Building energy modeling
software

Simulate retrofits and
calculate ROI

Autodesk Revit, EnergyPlus
(via university access)

Founder's Tip:

Why solution effectiveness certification is important: Without test data, your claim of '20% savings' is difficult to substantiate. Particularly for solutions related to hardware or construction systems, conducting formal testing at independent facilities will help enhance credibility and market acceptance.

6.2.2 Certification & Compliance Infrastructure

Many EE products or services need to meet standards or certification requirements—especially for scale-up in public or industrial markets.

Support resources:

- VNEEP technical assistance (via MOIT): Guidance on energy labeling, safety, and EE product standards TCVN / IEC test protocols: For lighting, HVAC, motors, building materials.
- Accredited testing labs: MOIT-listed labs across major cities can provide performance validation and compliance documentation.
- Support from NIC & SIHUB: Help startups understand regulatory pathways and access certifying bodies.

Tips:

Engage early. Many certifications take weeks or months. Use the Facility Access Planner to coordinate usage and documentation.

6.2.3 Prototyping & Fabrication Spaces

Before you validate, you need to build. Prototyping spaces give EE startups access to fabrication tools without investing heavily.

What to look for:

Facility Type	Common Tools Provided	Examples in Viet Nam
Maker Labs	3D printers, laser cutters, microcontroller kits	BK-HUB, FabLab Saigon, DNES (Da Nang)
Engineering workshops	Soldering, welding, CNC, PCB fabrication	HCMUT, HUST, or NIC-partnered labs
Industrial demo zones ⁷⁵	Pilot in real-world industrial settings	Industrial park partnerships (e.g., DEEP C)

6.2.4 Demonstration & Pilot Deployment Platforms

Scaling requires real-world data and reference customers. Demo zones or pilot sites are essential.

Where pilots can be deployed:

- Green factories or office buildings piloting retrofits (lighting, insulation, sensors)
- Government buildings via MOIT pilot schemes under VNEEP or others
- Living labs inside universities or NIC campuses
- Microgrids or smart energy communities supported by international donor in selected provinces

Tips:

Formalize these arrangements via a Pilot Agreement (MOU) to ensure responsibilities, data collection, and visibility. See Chapter 4 on Prototyping & Piloting.

6.2.5 Digital Infrastructure for Monitoring & Analytics

Energy efficiency is increasingly data-driven. Whether you’re offering a hardware solution or a consulting service, you need a digital layer to:

- Monitor performance remotely
- Generate analytics dashboards
- Provide ongoing customer support

⁷⁵ An industrial demo zone is a type of infrastructure or pilot site that allows startups to deploy and test their products in a real industrial environment, typically through partnerships with industrial parks.

Key tools:

- Remote monitoring: Blynk, ThingsBoard, IoT Dev kits
- Data analytics & visualization: Power BI, Grafana, Metabase
- CRM and ticketing: Zoho, HubSpot, Airtable
- Secure cloud storage: Google Cloud, Dropbox, AWS

Founder's Tip:

EE startups don't need to reinvent the wheel—but they must map and access the right infrastructure. By tapping into Viet Nam's growing ecosystem of labs, hubs, and digital tools, startups can build faster, test better, and scale smarter—with lower risk and higher credibility.

6.2.6. Infrastructure: Challenges in Scaling from Prototype to Mass Production

Transitioning from a prototype to mass production is one of the most difficult stages for energy efficiency (EE) startups. The main challenges include:

- **Lack of intermediate manufacturing facilities:** Many laboratories only support testing but lack pilot production lines, forcing startups to outsource abroad or invest beyond their capacity.
- **Unstandardized processes:** The absence of standardized operating procedures (SOPs), quality control systems, and ISO certifications leads to inconsistent products and limits scalability.
- **Limited supply chains:** EE components are often imported, resulting in high costs and dependence on foreign suppliers.
- **Insufficient expansion capital:** The costs of tooling, certification, and mass production far exceed the initial R&D budget.
- **Incomplete digital infrastructure:** The lack of ERP⁷⁶, MES⁷⁷, or PLM⁷⁸ systems makes it difficult to manage data and ensure traceability.

76 ERP (Enterprise Resource Planning) is an integrated enterprise management system that unifies functions such as accounting, human resources, manufacturing, supply chain, and sales on a single data platform, enabling operational optimization and informed decision-making.

77 MES (Manufacturing Execution System) is a real-time system that monitors and controls production processes, serving as the link between the ERP layer and shop-floor equipment to ensure quality, optimize performance, and provide full production traceability.

78 PLM (Product Lifecycle Management) is a platform that manages the entire lifecycle of a product—from ideation, design, and development to manufacturing and end-of-life—helping organizations synchronize technical data and improve cross-department collaboration.

Founder's Tip:

The solution is to develop flexible pilot production lines and build a network of manufacturing, testing, and financial partners, helping shorten the gap between testing and commercialization.

6.3 Partnering for R&D and Talent

In Viet Nam's fast-growing innovation and sustainability ecosystem, collaborating with universities and research institutions is one of the smartest moves EE startups can make. These partnerships help startups fill capacity gaps, access technical infrastructure, and strengthen credibility with customers, investors, and policymakers.

- EE startups often lack the capital to build in-house labs or hire senior technical staff.
- Universities like HCMUT, Hanoi University of Science and Technology (HUST), and Da Nang University of Science and Technology are equipped with relevant labs, testing tools, and a steady flow of young engineers.
- National programs like those led by NIC (National Innovation Center) or the Ministry of Industry and Trade are encouraging industry-academia collaboration as part of Viet Nam's green transition.

Types of Collaborations and How to Leverage Them

Table 30: Types of Collaborations and How to Leverage Them

Collaboration Type	What Startups Can Do	Practical Entry Points (Viet Nam Context)
Capstone Projects	Assign real-life challenges (e.g., energy audits, sensor design, BMS algorithms) to final-year students	Contact department heads of energy, mechatronics, or automation programs
Internships	Onboard talented students for technical, digital, or communications roles	Use internship programs from BK-HUB, SIHUB, or NIC-supported incubators
Joint R&D Proposals	Apply for public R&D grants with a university as co-implementer	Seek co-funding via national S&T programs or donor-funded initiatives
Faculty Mentorship	Request guidance from professors on technical choices or compliance standards	Offer co-authorship, site visits, or joint publications as incentives

Collaboration Type	What Startups Can Do	Practical Entry Points (Viet Nam Context)
Innovation Events	Gain visibility by presenting at university startup events, hackathons, or innovation day fairs	Partner with SIHUB, VNU-HCM, or TechFest university chapters

Case Insight: HCMUT / BK-HUB Experience

Startups working with BK-HUB at Ho Chi Minh City University of Technology have:

- Developed low-cost prototypes using university measurement equipment.
- Co-organized training workshops on IoT for EE systems.
- Built an internship pipeline, hiring trained students as full-time staff.
- Received support in drafting pilot project proposals for local industrial clients.

This type of embedded cooperation significantly reduces development costs and strengthens the startup's technical edge.

- For energy efficiency (EE) startups: Build a strong talent pipeline, reduce recruitment and training costs; gain access to specialized equipment and laboratory facilities; receive mentorship and technical validation from professors; enhance credibility and co-branding opportunities with academic partners.
- For universities and laboratories: Engage directly with industry, providing students with real-world experience; support research funding and co-publication opportunities; apply academic theory to practical contexts; and improve the employability of graduates.

Tip: Quick Readiness Checklist

Have we mapped universities with EE-related departments (e.g., automation, thermal engineering)?
Do we have at least one pilot or technical challenge suitable for student or faculty collaboration?
Are we prepared to host interns or provide supervision on student-led R&D?
Have we contacted any innovation hubs like NIC, SIHUB, or university TTOs (Technology Transfer Offices)?

6.4 Common Gaps and Workarounds

While energy efficiency (EE) startups in Viet Nam face significant opportunities, they also encounter practical and systemic challenges related to human resources and infrastructure. These gaps can be addressed through resourceful strategies, partnerships, and early planning.

Table 31: Common Gaps

Gaps	Description	Proposed Solutions
Skills gap between technical and business areas	EE startup founders are often strong in technical fields (mechanical–electrical, automation, materials, energy) but lack business modeling, fundraising, and market positioning skills.	• Connect with EE startup training programs under NIC, SIHUB, and VNEEP. • Recruit interns or co-founders with business backgrounds. • Enroll in courses on ESG, EE, and GHG reduction to broaden commercial understanding.
Limited access to laboratories and testing facilities	EE solutions must demonstrate verified energy-saving performance, but most startups cannot afford specialized testing labs.	• Partner with laboratories accredited by MOIT/VNEEP (e.g., HCMUT Energy Lab, IES). • Use shared facilities at NIC, SIHUB, or Techfest. • Leverage testing support programs under VNEEP3 or donor projects (GIZ, USAID).
Weak university–startup linkage	Many universities conduct EE-related projects (HVAC, IoT, energy simulation) but lack collaboration with startups for technology transfer or real-world testing.	• Sign R&D and pilot testing MoUs between startups and engineering faculties. • Invite lecturers as technical advisors or co-researchers. • Organize “Energy Innovation Day” to connect academia, startups, and industry.

Gaps	Description	Proposed Solutions
Complexity of certifications and standards	EE products must comply with TCVN, IEC, and national energy labeling standards, but the guidelines are fragmented and difficult for start-ups to access.	- Consult STAMEQ and the Ministry of Industry and Trade (MOIT). - Use R&D templates from VNEEP3 to design standardized testing. - Collaborate with independent certification bodies (Quatest, DoIT). - Refer to Decision 280/QĐ-TTg on EE regulations

6.5. Practical Tools & Templates

Building strong teams and leveraging the right infrastructure requires intentional planning. This section introduces four actionable tools designed specifically for early-stage energy efficiency (EE) startups in Viet Nam. These templates are easy to adapt, lightweight, and focused on real implementation needs.

Table 32: Tools for early-stage EE startups in Viet Nam

Tool	What It Helps You Do	Key Components	How to Use It
Competency Map	Identify team roles, assess current capabilities, and plan hiring or upskilling.	- List of common EE start-up roles (e.g., Energy Auditor, Tech Lead, Sales Manager) - Required technical & soft skills per role - Skill level indicators: Basic / Intermediate / Advanced - A visual matrix mapping team members to competencies	Use during team formation, scaling, or strategic planning. Helps founders spot capability gaps and prioritize recruitment or training investments. Also valuable during funding rounds to show HR planning

Tool	What It Helps You Do	Key Components	How to Use It
R&D Collaboration Proposal Template	Prepare a professional proposal to engage with research institutions or labs.	• Executive summary & project goals • Roles & responsibilities of each party • Workplan & timeline • Expected outputs (e.g., prototype, test data) • Budget & resource contributions • IP and data-sharing terms	Apply when approaching universities, public labs, or international programs. Helps secure pilot sites, testing facilities, or R&D co-funding. Also useful for preparing consortium proposals.
Lab & Facility Access Planning Sheet	Coordinate access to shared labs, testbeds, or maker spaces.	• Project owner & contact info • Description of equipment needed • Purpose of use (testing, calibration, prototyping) • Booking schedule & actual usage log • Safety and compliance checklist	Use when working with NIC, SIHUB, or university innovation spaces. Supports resource planning and ensures responsible, documented use. May be required for facility reporting or grant audits
3–6 Month Talent Development Plan	Design short-term learning paths for team members to improve skills and retain talent.	• Development goals aligned with business needs • Training methods (e.g., mentorship, courses, certifications) • Milestones & success criteria • Timeline & check-ins with mentors	Use during staff onboarding, performance reviews, or when preparing someone for a leadership or technical role. Encourages a culture of continuous learning, even with a small team.



CHAPTER

07

**TECHNOLOGY AND
INNOVATION FOR ENERGY
EFFICIENCY**



CHAPTER 7. TECHNOLOGY AND INNOVATION FOR ENERGY EFFICIENCY

For EE startups, innovation and technology are not just supportive tools—they are the foundation for differentiation, scalability, and long-term impact. In a sector where energy savings must be measurable, solutions must be cost-effective, and compliance must be verifiable, startups must harness the power of digitalization and technological innovation to stay competitive and relevant.

Vietnam's strong commitment to green growth and digital transformation has created a fertile environment for the development and deployment of technology-driven EE solutions. At the same time, enterprises across industry, buildings, and transport face increasing pressure to improve energy performance, reduce emissions, and comply with tightening regulations and standards. These combined drivers create both market demand and opportunity for tech-enabled EE innovations.

Startups that successfully integrate innovation into their business models—ranging from advanced sensors and AI-powered optimization to cloud-based energy management platforms—can deliver greater value to clients, ensure more accurate impact measurement, and unlock access to new markets and financing.

This chapter explores these innovation trends shaping the future of energy efficiency in Vietnam. It also highlights sector-specific technology applications, identifies common challenges faced by startups, and outlines strategic opportunities for entrepreneurs to lead the country's transition toward smarter, greener energy use.

7.1 Key Innovation Trends in Energy Efficiency

For EE startups, staying ahead of innovation trends is essential—not only to differentiate their offerings but also to meet evolving market needs, standards, and investor expectations. The following innovation trends are reshaping the EE landscape and creating new opportunities for agile, tech-savvy startups:

7.1.1 Digitalization and Smart Energy Management:

As energy consumption grows more complex across sectors, the integration of digital tools is becoming indispensable. Smart energy management solutions help organizations reduce waste, optimize operations, and meet compliance requirements. Key technologies include:

- IoT-based sensors and meters: These collect granular data on energy usage across machines, buildings, and infrastructure in real time.

- Capex-heavy: Requires upfront investment in hardware, installation, and calibration.
- Compatible with ESCO & PAYS: These technologies can be bundled into ESCO contracts or financed through PAYS models, where savings from energy monitoring offset hardware costs over time.
- **Cloud-based EMS (Energy Management Systems):** Enable remote management, benchmarking, and anomaly detection across multi-site facilities.
 - SaaS-able: Typically offered via subscription with minimal upfront cost and high scalability.
 - Compatible with ESCO & leasing: EMS can be embedded in ESCO service models or bundled with leased assets like chillers or lighting systems for optimized operations
- **Mobile/web dashboards:** Allow facility managers to visualize trends, generate reports, and respond to issues proactively.
 - SaaS-able: Light software layer
 - Compatible with ESCO: Real-time monitoring of energy savings performance, Optimizing maintenance and operations

These tools are particularly useful for commercial and industrial energy users seeking transparency, automation, and alignment with green certification systems (ISO 50001, LEED).

Startup Example:

Dexma (Spain) – Offers a cloud-based EMS platform that uses IoT sensors, analytics, and AI to help SMEs and building owners monitor and optimize energy performance.
(<https://www.dexma.com/>)

7.1.2 AI and Predictive Analytics:

Artificial Intelligence (AI) is transforming energy management from reactive to predictive and automated. When applied effectively, AI systems can:

- Continuously adjust HVAC, lighting, and equipment settings based on occupancy or environmental conditions.
 - Hybrid model: the hardware (sensors, controllers) is capex-heavy, while the control software is increasingly SaaS-able.
 - Compatible with ESCO and PAYS models—energy savings are measurable and can be used to repay investment.
- Detect and diagnose inefficiencies before they lead to downtime.

- SaaS-able: especially when bundled with existing energy management systems. Minimal hardware required beyond data integration
- Compatible with ESCO, PAY: ESCO for ongoing efficiency performance; PAYS applicability is limited unless linked to avoidable downtime costs.
- Recommend operational strategies based on learning from historical patterns.
 - SaaS-able – typically delivered as part of a cloud-based EMS platform.
 - Compatible with ESCO, PAYS: Well-suited for ESCO contracts that guarantee performance optimization

This allows businesses to achieve significant energy savings and reduce maintenance costs—particularly in large commercial buildings and industrial environments.

Startup Example:

*BrainBox AI (Canada) – Leverages deep learning and real-time data to optimize HVAC systems in buildings autonomously, cutting energy consumption by up to 25%.
(<https://www.brainboxai.com/>)*

7.1.3 Integration with Renewable Energy Systems:

Energy efficiency (EE) and renewable energy (RE) are increasingly converging through integrated systems. This allows:

- Dynamic load balancing: Matching supply (e.g., rooftop solar) with demand.
 - Hybrid: Control software can be delivered as a SaaS, but still requires investment in sensors and control devices (Capex-heavy).
 - Compatible with ESCO and PAYS, especially when integrated with solar PV systems. Leasing is feasible for hardware components
- Storage integration: Using batteries to store excess generation and reduce peak demand.
 - Capex-heavy: Requires significant capital investment in batteries, inverters, and integration systems.
 - Compatible with ESCO and PAYS, particularly in markets with time-of-use pricing or demand charges. Leasing can be applied to battery systems.
- Microgrid optimization: Enabling efficient, decentralized energy ecosystems.
 - SaaS-able: optimization and control software can be offered as a SaaS solution.
 - Compatible with ESCO: especially in industrial zones, smart cities, or university campuses.

Startup Example:

Cleanwatts (Portugal) – Pioneers “Energy Communities” that integrate solar generation, storage, and EE management using a digital platform to democratize access to clean energy.
(<https://www.cleanwatts.energy/>)

7.1.4 Green Materials and EE Equipment:

Improvements in materials science and engineering have enabled the development of high-performance EE products, such as:

- Advanced insulation and reflective materials: Reduce thermal losses in buildings.
 - Capex-heavy, as it involves physical upgrades to the building structure.
 - Compatible with ESCO, PAYS when savings can be measured and guaranteed
- Next-gen appliances and motors: Meet or exceed MEPS (Minimum Energy Performance Standards).
 - Capex-heavy, involving upfront hardware purchases.
 - Compatible with ESCO and PAYS, especially for industrial users. Leasing is possible for high-efficiency industrial motors and commercial appliances.
- Passive cooling techniques: Minimize energy use for space cooling in hot climates.
 - Capex-heavy, as it typically requires design or structural modifications.
 - Compatible with ESCO, PAYS in building retrofits

Startup Example:

Aeroseal (USA) – Offers duct-sealing technology that prevents energy loss in HVAC systems, improving efficiency and indoor air quality.
(<https://aeroseal.com/>)

7.1.5 New Business Models and Financing Innovations:

The upfront cost of EE upgrades is a major barrier for many organizations. Innovative business models are helping bridge this gap:

- Energy-as-a-Service (EaaS): Bundled EE solutions paid over time through savings.
 - Capex-heavy: at the system level, but experienced as a service by the customer.
 - Compatible with ESCO, leasing, and PAYS: as EaaS often includes performance-based or subscription payment structures.
- ESCO contracts: Guarantee energy savings and take on project performance risk.

- Capex-heavy, but performance-based and structured to eliminate upfront cost for the client.
- Compatible with ESCO: The core of the ESCO model itself.
- Green bonds and blended finance: Mobilize institutional capital for EE infrastructure.
 - Capex-heavy: targeting long-term infrastructure investments.
 - Compatible with ESCO: especially for large portfolios.

Startup Example:

*Redaptive (USA) – Offers EaaS and turnkey solutions for energy upgrades, backed by financing models that align with client cash flows and sustainability goals.
(<https://redaptive.com/>)*

7.1.6 Smart and Efficient Transport Solutions:

The transportation sector accounts for a large share of fossil fuel consumption. EE innovations in this space include:

- Electric Vehicles (EVs): From electric scooters to buses and logistics fleets.
 - Capex-heavy, due to high upfront costs for vehicles and charging infrastructure.
 - Compatible with leasing (widely used), and some ESCO-like fleet-as-a-service models
- Fleet & logistics platforms: Use data to optimize routes, loads, and fuel consumption.
 - SaaS-like: typically provided as cloud-based subscriptions or integrated logistics services.
 - Compatible with leasing and service contracts. Can be bundled into performance-based logistics agreements or fleet management offerings
- Micro-mobility: Shared e-bikes and scooters for last-mile connectivity.
 - Capex-heavy at the system/operator level, but SaaS-like for users through ride-sharing platforms.
 - Leasing and pay-per-use models are common. May integrate with PAYS-like mobility-as-a-service platforms in smart city ecosystems.
- Alternative fuels: Hydrogen, biofuels, and hybrid conversions for heavy transport.
 - Capex-heavy, especially for fueling infrastructure and vehicle modifications.
 - Compatible with ESCO, leasing: Leasing can be used for converted or new vehicles. May be linked to green infrastructure bonds or ESCO models in public transport upgrades.

Startup Example:

*Selex Motors (Vietnam) – Develops electric motorbikes, swappable battery systems, and a digital fleet management platform tailored to delivery and mobility services.
(<https://selex.vn/>)*

7.2. Sector-Specific Technology Applications

The application of energy efficiency (EE) technologies varies significantly across sectors, reflecting differences in energy consumption patterns, infrastructure needs, and regulatory pressures. This section highlights priority EE technologies in three key sectors—industry, buildings, and transportation—where startups can tailor their innovations to create measurable impact and market value.

Table 33: Industrial energy efficiency technologies and startup solutions

Category	Relevant Technologies	Example
Energy Management System and Loss Prevention	• AI-powered energy analytics: helps analyze consumption patterns, forecast demand, detect anomalies, and recommend energy-saving actions. • IoT sensors and automation: Enable continuous monitoring of equipment performance and energy use across production lines. • Cloud-based predictive maintenance: Reduces downtime and enhances reliability by detecting potential failures before they occur. • Automation and robotics: Maximize machine uptime while reducing unnecessary energy use. • Smart energy management software (EMS): Offers intuitive dashboards and data-driven insights for improving plant-wide EE.	IoTeamVN has implemented AIoT-based solutions for energy monitoring in industrial facilities. For example, their EMS deployment at Viglacera Thăng Long factory meets ISO 50001 standards, offering real-time monitoring, automated reporting, and analytics for quick issue detection and CO2 reduction ⁷⁹

⁷⁹ <https://ioteamvn.com/du-an-nha-may-viglacera-thang-long/>

Category	Relevant Technologies	Example
Waste Heat Recovery	- Organic Rankine Cycle (ORC) systems convert low- to medium-grade waste heat into electricity. - IoT and AI integration: Sensors and analytics optimize operation and maintenance of WHR systems. - Digital twins: Simulate WHR operation to improve efficiency and reduce trial-and-error in design. - Micro-Combined Heat & Power (micro-CHP): Supplies both heat and power locally, increasing overall plant efficiency.	ESEC (Engineering & Smart Energy Co., Ltd) implemented an autoclave Heat Recovery Autoclave system targeting industrial heat reuse. Their project captures steam waste and reinjects it, reducing fuel consumption for sterilization and increasing process efficiency ⁸⁰
Energy Retrofit Systems	- Smart LED lighting with occupancy sensors: Automatically adjusts lighting based on presence and daylight, reducing energy use by 50–70% in workshop and warehouse settings. - High-efficiency motors + Variable Frequency Drives (VFDs): Optimize motor speed to match actual demand, significantly cutting energy waste in pumping, ventilation, and conveyor systems. - Efficient HVAC and heat recovery systems: Improve temperature control and airflow using advanced chillers, economizers, and exhaust heat recovery solutions. - Renewables + energy storage: Rooftop solar PV systems combined with battery storage offer peak load reduction and resilient power supply. - Smart grid & demand response systems: Enable factories to reduce or shift load during peak tariff hours, participating in utility demand response program	BenKon Energy Efficiency Solutions applies AI and IoT to optimize air conditioning usage across Vietnamese commercial buildings and small factories ⁸¹ .

⁸⁰ <https://www.esec.vn/vi/esec-cung-cap-giai-phap-tai-su-dung-nang-luong-nhiet-tu-noi-hap-heat-recovery-autoclave/>

⁸¹ <https://benkon.io/>

Table 34: Energy efficiency technologies and startup solutions for buildings

Category	Relevant Technologies	Example
Smart Building Technology	• Building Energy Management Systems (BEMS): AI-powered platforms that integrate and optimize HVAC, lighting, and other building systems. • Automated Demand Response Systems: Automatically adjust energy use during peak periods to lower grid stress and utility costs. • Integrated IoT Platforms: Connect building systems for comprehensive data collection and energy performance tracking. • User-Friendly Interfaces: Mobile and web dashboards allow easy control and energy use customization. • Smart Grid Integration: Enables real-time pricing response and load balancing.	Lumi Viet Nam offers smart building and home automation solutions. Its IoT-based systems integrate lighting, HVAC, and sensors to optimize energy use, improve comfort, and enable centralized control⁸². Lumani: Cloud-based BMS/BEMS model (SaaS) with a lightweight gateway, optimizing HVAC and lighting systems, integrating FDD and ADR features; reduces electricity consumption by 8–15% without requiring large CapEx, suitable for commercial buildings in Vietnam.
Sustainable Construction Materials	• Advanced Insulation: High-performance materials made from recycled or renewable sources that improve thermal performance and reduce energy use. • Lightweight High-Strength Concrete: Alternatives such as geopolymers or fiber-reinforced concrete that lower structural weight and enhance energy efficiency. • Phase Change Materials (PCM): store and release thermal energy to regulate indoor temperature, reducing HVAC load.	Straw Wood team, from Tra Vinh University, converts agricultural straw waste into carbon-negative insulation panels, offering a renewable alternative to traditional wood and synthetic insulation. Notably, Straw Wood won first prize at the Global Viet Nam Business Startup 2025 in London⁸³.

82 <https://smarthome.lumi.vn/>

83 <https://en.vietnamplus.vn/global-vietnam-business-startup-2025-winners-announced-post321149.vnp>

	• AI-powered Energy Simulation Tools: Multi-variable simulation software that evaluates and optimizes design parameters—such as orientation, material choice, and envelope design—to reduce energy use. • Virtual & Augmented Reality (VR/AR): VR supports immersive energy performance visualization during design, while AR enhances maintenance of energy systems post-construction. • Passive Design Optimization: Use AI-integrated simulation software to model natural ventilation and daylighting, reducing dependence on artificial cooling and lighting.	
Energy Efficiency Renovation for Existing Buildings	• Smart HVAC retrofits: Integrate advanced controls, variable-speed components, and energy recovery systems to reduce energy consumption and enhance occupant comfort. • Lighting upgrades with LED and automation: Replace outdated lighting with high-efficiency LED systems combined with motion sensors, dimming controls, and scheduling to optimize usage and reduce electricity costs. • High-performance window and door replacements: Utilize technologies such as laminated glass, low-emissivity (Low-E) coatings, and vacuum-insulated glazing to improve thermal insulation and minimize energy loss from air leakage or heat transfer.	Benkon offers a smart air-conditioning control solution designed to retrofit existing buildings with minimal disruption. Their AI-powered controller uses sensors to monitor temperature, occupancy, and usage patterns, enabling dynamic optimization of HVAC systems ⁸⁴ .

Category	Relevant Technologies	Example
AI-Based Simulations and Design Optimization	• Building Information Modeling (BIM): Enhanced with energy data to optimize performance across the building lifecycle. • Digital Twin Technology: Real-time virtual replicas of buildings that use AI and IoT to monitor energy flows and simulate operational adjustments. • AI-powered Energy Simulation Tools: Multi-variable simulation software that evaluates and optimizes design parameters—such as orientation, material choice, and envelope design—to reduce energy use. • Virtual & Augmented Reality (VR/AR): VR supports immersive energy performance visualization during design, while AR enhances maintenance of energy systems post-construction. • Passive Design Optimization: Use AI-integrated simulation software to model natural ventilation and daylighting, reducing dependence on artificial cooling and lighting.	EDEEC (Vietnam) specializes in energy simulation and green building consulting. The company uses advanced software tools to model energy performance, evaluate retrofit scenarios, and optimize HVAC and lighting systems for commercial and industrial buildings ⁸⁵ .
Integrated Renewable Energy Solutions	• Architectural Integration of Solar Energy: Develop aesthetically pleasing solar solutions—such as colored PV panels, solar roof tiles, or façade-integrated modules—that blend seamlessly with building design while generating clean energy.	Xsolar is a Vietnamese start-up specializing in turnkey rooftop solar solutions for residential and commercial buildings. Their offerings include design, installation, smart monitoring systems, and integration with battery storage ⁸⁶ .

85 <https://edeec.com>

86 <https://xsolar.vn>

- **Energy Storage Systems:** Offer battery and thermal storage technologies that enhance the efficiency and reliability of on-site renewable energy by storing excess power and managing load fluctuations.
- **Building-Scale Microgrids:** Design and implement localized energy systems that combine solar, storage, and smart controls to provide greater energy independence, improve resilience, and reduce reliance on the central grid—especially for commercial campuses and industrial parks.

Table 35: Energy efficiency technologies and startup solutions for transport sector

Category	Relevant Technologies	Example
EVs and Charging Infrastructure	• Affordable EV development: Design electric scooters, buses, and compact vehicles tailored to Vietnam’s urban and rural needs. • Battery and charging solutions: Expand battery swapping networks and fast-charging stations to reduce range anxiety and increase user convenience. • Renewable integration: Enable solar-powered charging stations and explore Vehicle-to-Grid (V2G) solutions for enhanced grid resilience	Selex Motors (Vietnam) – Develops electric scooters, battery-swap stations, and integrated fleet platforms for logistics and delivery services ⁸⁷ .

Category	Relevant Technologies	Example
Smart Mobility and Fleet Management	• AI and IoT for logistics: Use smart route planning, dynamic traffic control, and real-time vehicle tracking to reduce idle time, fuel waste, and delivery delays. • Ride-hailing and carpooling platforms: Promote shared mobility solutions to reduce traffic congestion and emissions. • Fleet optimization systems: Apply predictive maintenance, driver behavior analytics, and automated reporting to improve vehicle performance and cost efficiency. • Digital maps and traffic data: Utilize real-time navigation tools and traffic analytics to minimize travel times and fuel use.	BusMap (Vietnam) – A smart mobility app that provides real-time public transport information, route planning, and traffic updates to improve commuting efficiency in major cities⁸⁸. Abivin: A SaaS platform that optimizes transportation and logistics using AI and Vehicle Routing Problem (VRP) algorithms; it automatically plans routes and delivery schedules, monitors execution, and reports fuel savings, helping fleets reduce operating costs and emissions.
Smart Transport Infrastructure	• AI-powered traffic lights: Adjust signal timing based on real-time traffic conditions to reduce congestion and fuel consumption. • Smart parking systems: Use IoT sensors and mobile apps to direct drivers to available parking spaces, minimizing idle driving and emissions. • Vehicle-to-Infrastructure (V2I): Enable real-time communication between vehicles and traffic systems to support smoother, safer, and more energy-efficient travel. • Dynamic routing apps: Provide real-time updates to reroute traffic away from congested areas, helping logistics firms and commuters reduce travel time and fuel use.	VietChao has deployed automated smart-parking systems across multiple Vietnamese cities and commercial developments. These systems—including tower-style and mini-tower garages—use IoT sensors and smart software to manage vehicle entry, availability detection, and payment. This reduces circulation time in parking lots and minimizes emissions, particularly in dense urban areas⁸⁹.

89 <https://vietchao.vn/san-pham/du-an-he-thong-do-xe-tu-dong/>

		Phenikaa MaaS (Vietnam) specializes in smart mobility platforms, traffic data, and AI-driven public transport solutions ⁹⁰ .
Personal Mobility and Urban Transport	• Electric bikes and scooters: Provide compact, low-emission options for short-distance commuting and delivery services. • Bike and pedestrian infrastructure: Promote sustainable mobility by developing safe, accessible lanes, parking, and shared spaces. • Micromobility innovation: Design and deploy lightweight electric vehicles (e.g., e-scooters, self-balancing vehicles) for last-mile connectivity and shared use models.	Dat Bike (Vietnam) builds high-performance electric motorbikes for Vietnam's urban commuters ⁹¹ .
Green Logistics and Freight Transport	• Route optimization software: Use AI and real-time data to identify the most fuel-efficient delivery paths, minimizing emissions and costs. • Electric and hybrid freight vehicles: Support the transition to low-emission transport modes in last-mile and intercity logistics. • Efficient freight hubs: Design centralized hubs to reduce transfer times, improve coordination, and lower overall energy consumption.	VoxCool has developed a pioneering "cold battery" system—an intelligent thermal energy storage solution integrated with AI and IoT—for cold chain logistics and storage. Their cold battery can fully replace diesel-powered refrigeration, storing cooling capacity for up to 72 hours ⁹² .

90 <https://phenikaamaas.com/>

91 <https://dat.bike/>

92 <https://voxcool.com.vn/>

7.3. Key Technological Challenges

While technological innovation is central to the success of EE startups, it also presents multiple challenges—particularly in adapting to Vietnam’s industrial and building contexts. This section outlines common technology-related obstacles and provides practical recommendations to help startups overcome them and accelerate adoption.

Table 36: Key Technological Challenges

Technological Challenge	Description	Strategic Advice for Startups
Integration with Legacy Systems	Many EE solutions must connect with outdated or non-standardized systems (e.g. factory SCADA, HVAC controllers, utility meters).	Build modular, interoperable platforms with APIs; offer integration services; prioritize plug-and-play models for key segments.
Lack of Standardized Data Formats	Energy data is often scattered, inconsistent, or manually recorded, making analytics and optimization difficult.	Use data normalization techniques; develop user-friendly dashboards; advocate for standardization in pilot projects and public tenders.
Limited IoT & Sensor Infrastructure	Many SMEs lack basic IoT infrastructure for real-time monitoring, limiting the effectiveness of advanced EE solutions.	Offer bundled sensor-installation packages; start with low-cost edge devices; provide cloud-lite versions for limited bandwidth areas.
AI/ML Models Lack Local Training Data	Predictive models (e.g., for load forecasting, fault detection) may underperform due to lack of high-quality local datasets.	Collaborate with academia/industry to build anonymized datasets; incorporate hybrid modeling (rule-based + AI); invest in pilot-based learning.
High Customization Needs	Different buildings, factories, or fleets have unique operating conditions that require solution adjustments.	Use parametric design frameworks and adaptive control systems; develop sector-specific templates (e.g., for cold storage, textile, hotels).

Technological Challenge	Description	Strategic Advice for Startups
Energy Simulation Gaps in Early Design	Few startups have access to or can afford high-quality simulation tools for EE system design, leading to under-optimized installations.	Partner with universities (e.g., EDEEC) or access open-source tools; apply for grants that subsidize simulation and prototyping costs.
Cybersecurity and Data Privacy	EE tech increasingly involves remote access and sensitive consumption data—posing risks of cyber threats or customer mistrust.	Build in data encryption and user consent frameworks; comply with Vietnam’s Decree 13/2023/ND-CP on personal data protection.

7.4. What Startups Should Do to Accelerate Technology Deployment

Although technological challenges may slow adoption and limit the impact of innovative energy efficiency (EE) solutions, they are not insurmountable barriers. By applying the right strategies—from building partnerships to leveraging standards and public support programs—startups can turn challenges into opportunities.

The following section outlines specific and practical strategies that EE startups in Vietnam can adopt to accelerate technology deployment and bring their solutions to market faster.

Table 37: What Startups Should Do to Accelerate Technology Deployment

Strategy	What Startups Should Do
Partner with Industrial Zones, Real Estate Developers, ESCOs	- Offer pilot projects or performance-based EE contracts. - Target industrial parks, commercial buildings, and ESCO partners.
Engage in Sandbox Programs and Smart City Pilots	- Apply to regulatory sandbox initiatives (e.g., HCMC under Resolution 98/2023). - Propose testbeds aligned with city-level EE or green goals.
Align with Standards and Certifications	- Design solutions compliant with ISO 50001, LOTUS/EDGE, ESG standards. - Highlight certification alignment in investor/client pitches.

Use Open-Source and Low-Code Tools	• Build MVPs using platforms like OpenEMS, EnergyPlus, Node-RED, or Power BI. • Reduce development costs while maintaining core functionality.
Collaborate with Universities and R&D Centers	• Co-develop or test products with institutions (e.g., NIC...). • Access labs, student talent, and joint R&D opportunities.

7.5. Intellectual Property Protection for EE Startups in Vietnam

Vietnam has built a comprehensive intellectual property (IP) framework under the Law on Intellectual Property (2005, amended in 2009, 2019, and 2022) to strengthen protections and reflect treaty commitments. As a WTO and WIPO member, Vietnam adheres to the TRIPS Agreement and major treaties such as the Paris and Berne Conventions, PCT, and Madrid Protocol, ensuring alignment with global norms and facilitating international IP filings.

For startups, IP plays a strategic role, creating negotiable competitive advantages, supporting partnerships, licensing, and higher valuations during fundraising. IP should wrap around the business model, not stand alone as a legal formality. The core principle is “protect to transact” — use patents/utility solutions and trademarks to secure components that are hard to reverse-engineer, while keeping trade secrets for algorithms, control parameters, and performance data. This combination builds a strong technical barrier, enabling negotiations for exclusive rights by sector or geography, licensing, or co-development with partners. It also allows flexibility to shift toward SaaS or EMaaS models for rapid scaling while maintaining a competitive edge. Design your IP strategy based on target markets: prioritize filings where revenue and partners are located, and align IP milestones with commercial milestones (e.g., pilot completion, MRV certification, first contract) so that IP truly enhances valuation — not just serves as a “counting metric.”

The second critical aspect of IP strategy is that investors need to see that the technology is not only protected but also deployable. The minimum documentation package consists of four layers:

- (1) A Clear IP Portfolio: (Applications/Granted Patents, Trademarks, Industrial Designs; including status, territory, and priority dates).
- (2) Freedom to Operate (FTO)⁹³ & Patent Landscape: Benchmarking protection claims against technologies in the market to demonstrate the freedom to exploit.

⁹³ Freedom to Operate (FTO): an analysis confirming a product can be commercialized without infringing third-party patents.

(3) Evidence Pack ⁹⁴: Technical documents and evidence to prove efficacy, including MRV-compliant pilot data, independent verification reports, and internal security protocols.

(4) Contracts & Policies: Non-Disclosure Agreements (NDAs), IP Assignment Agreements, IP clauses in employment/contractor contracts, and data usage rights (especially for SaaS/BEMS models).

Organizing these four layers helps mitigate legal risks, shortens the Due Diligence (DD) process, and transforms IP from mere “paperwork” into revenue-generating assets.

Table 38: Types of intellectual property and scope of protection

Category	Scope & Coverage	Term of Protection	Notes
Patents & Industrial Property	- Inventions, utility solutions (utility models), industrial designs, trademarks, geographical indications, and layout designs of integrated circuits. - First-to-file principle.	- Inventions: 20 years from filing. - Utility solutions: 10 years. - Industrial designs: 5 years, renewable up to 15 years.	Vietnam recognizes both invention patents and utility solution patents, giving flexibility depending on the level of inventiveness (e.g. in energy technology).
Trademarks	- Brands, logos, names, etc. - Protection established through registration; well-known marks protected based on reputation. - Includes trade names (through use) and domain names (first-come, first-served).	Renewable 10-year periods.	Vietnam is a member of the Madrid System for international trademark registration, simplifying global brand protection.

94 F Evidence Pack: In intellectual property, an “Evidence pack” is a collection of detailed technical documents and evidence used to demonstrate the uniqueness, feasibility, and other technical aspects of an invention or product

Copyrights	- Literary and artistic works, software code, films, photographs, and other creative works. - Automatic upon creation (no registration required).	- Most works: 50 years after author's death. - Photos, films, etc.: 75 years from publication..	Registration is not mandatory but recommended for disputes. Computer programs/software are protected as copyrighted works (not patentable in Vietnam).
Trade Secrets	- Confidential information, formulas, processes, or data. - Must provide business advantage, not publicly known, and actively kept secret.	Potentially indefinite (as long as secrecy is maintained).	- No formal registration system. - Requires reasonable protective measures (NDAs, internal protocols). - Misappropriation prohibited (considered unfair competition). - Risk: Can be reverse-engineered -> startups must weigh between patenting vs. keeping trade secrets.

Table 39: IP Administration and Registration Procedures

Agency	Governing Body	Scope & Responsibilities	Registration Procedures & Notes
Intellectual Property Office of Vietnam (IP Vietnam / NOIP)	Ministry of Science and Technology	Administers industrial property rights, including patents, utility solutions, industrial designs, trademarks, and geographical indications.	- Patents: Require detailed description; published 18–19 months after filing (third-party oppositions allowed). - Grant process takes 2–3+ years. - Trademarks: Registration ~15 months in straightforward cases. - International protection: As PCT member, Vietnam allows applicants to seek patent rights internationally; Madrid Protocol enables global trademark registration.
Copyright Office of Vietnam (COV)	Ministry of Culture, Sports and Tourism	Administers copyright and related rights.	While registration is not mandatory, filing for a certificate is an option—this is particularly beneficial for software, training manuals, and marketing collateral.
Plant Variety Protection Office	Ministry of Agriculture and Rural Development	Administers rights for new plant varieties.	- Applies mainly to agriculture/biotech sectors (e.g., biofuel crops). - Vietnam is a UPOV member.

Tips: Vietnam operates on a “first-to-file” basis for patents and trademarks, meaning whoever files an application first has priority to the rights. Startups should file early for protection of their inventions and brand names, ideally before publicly disclosing their innovations or entering the market. Foreign companies entering Vietnam are likewise advised to secure local IP registrations in advance. Similarly, Vietnamese startups expanding abroad should consider IP filings in target markets (using PCT for patents and Madrid for trademarks) to secure their competitive position internationally.

Table 40: Importance of IP Protection for EE Startups

Dimension	EE Context	Benefits for EE Startups
Incentivizing Innovation and R&D	- Developing EE technologies requires long R&D cycles and significant investment. - Patents provide 20 years of protection, granting market exclusivity. - IP encourages continuous innovation and pushes competitors to either invent their own solutions or license the technology.	- Secures returns on R&D investment. - Motivates continuous development of EE solutions. - Drives the green innovation ecosystem and supports climate goals.
Competitive Advantage	- Patents prevent large firms from copying energy-saving technologies. - Trademarks build customer trust, especially important for EE products requiring certification and credibility. - Trade secrets (e.g., proprietary algorithms for energy management, unique EE manufacturing processes) sustain long-term competitiveness. - In Vietnam, 60–70% of startups lack IP protection, leaving them vulnerable.	- Creates sustainable competitive barriers. - Strengthens reputation and branding in the global EE market. - Differentiates EE startups in the clean tech sector.

Dimension	EE Context	Benefits for EE Startups
Attracting Investment and Funding	- Investors ask: “What stops others from doing the same thing?” - Protected IP demonstrates defensible intangible assets that can be monetized (e.g., licensing EE technologies). - New Vietnamese regulations allow IP rights to be used as capital contributions or collateral for financing.	- Increases investor confidence. - Justifies higher company valuation. - Enhances access to venture capital and green financing.
Market Access and Expansion	- EE technologies often have global applicability (e.g., efficient motors, smart building management). - Registering IP in export markets prevents competitors from hijacking innovations or brands. - Strong IP reassures international partners and enables participation in supply chains.	- Facilitates international expansion. - Enables participation in global supply chains. - Supports safe and profitable technology transfer in EE.



CHAPTER

08

**MARKET RESEARCH,
CUSTOMER ACQUISITION,
AND BRANDING**



For EE startups, success depends not only on building a technically sound solution but also on effectively communicating its value and converting interest into paying customers. In EE, where solutions are often intangible (e.g., reduced energy bills or lower carbon emissions), founders face the added challenge of overcoming skepticism, complex decision-making processes, and long sales cycles.

EE startups typically serve a diverse set of customers, each has different incentives, decision cycles, and buying behaviours:

- Business-to-Business (B2B): Selling to commercial or industrial customers.
- Business-to-Government (B2G): Working with government agencies.
- Business-to-Consumer (B2C): Engaging households or individual residents.

This chapter helps EE startups tailor their acquisition strategies to these audiences. Customer acquisition is not only about building awareness but also about initiating interest and guiding potential customers from awareness to adoption. The chapter is structured around the startup journey—from identifying target users to converting leads and retaining customers.

Before exploring outreach channels, it's important to understand that customer acquisition is a multi-stage process and not a single touchpoint or interaction. EE startups shall guide their audiences from awareness through interest, evaluation, and finally to conversion. Each segment (B2B, B2G, B2C) will require different outreach approaches depending on their decision cycles and where they are in the adoption process. The outreach strategies in this chapter are grouped by channel type and mapped to match specific customer segments and startup maturity.

8.1 Understanding Your Market & Customers

Market research and positioning help founders avoid one of the top reasons startups fail: building something no one truly needs. These tools help refine your solution based on user feedback, identify the right customers, avoid wasted marketing spend, and increase your chances of funding and growth. Strong positioning (via clear value propositions and Unique Selling Points - USP) makes complex EE solutions easier to understand, trust, and adopt.

Goal: *Make sure you're solving a real need for the right people.*

8.1.1 Define your ideal customers

Around 42% of startups fail because they build something nobody wants. In Viet Nam's energy efficiency sector, this risk is even higher due to relatively low market awareness, long sales cycles, and technical solutions that may be under-prioritized.

Market research helps EE startups avoid this trap. It ensures you're solving a real, urgent problem, aligned with actual customer pain points, budget constraints, and decision-making behaviour. It also strengthens your pitch to both users and investors, by replacing assumptions with validated evidence. When done correctly, market research provides actionable insights that guide strategic planning, product development, and resource allocation.

In this chapter, we examine the market research process, and the different types of research involved. We begin by introducing how to plan a market research project, from identifying and formulating the research problem to presenting the findings and outlining the follow-up actions.

Define your ideal customers: Before building or scaling your product, define exactly who you're solving for. In EE, your customer may not always be the end-user—it could be a facilities manager, public agency, factory operations lead, or even an ESCO company.

Tips:

Don't guess. Talk to 5-10 real potential customers early even without a product. Their answers shape everything.

Table 41: Define your ideal customers

Key Profile Element	What to Learn	Why It Matters for EE Startups
Demographics	Industry type (e.g., garment, F&B, public buildings), size, location	Helps define project scale, solution format (e.g., rooftop solar vs HVAC)
Pain Points	What energy-related costs, inefficiencies, or policy pressures they face	Aligns your value proposition with real, financially relevant problems
Current Solutions	What tools/services they use (manual tracking, outdated systems, etc.)	Reveals market gaps or integration opportunities
Decision Behavior	Who makes purchase decisions? What is their budget cycle or capex limit?	Crucial for crafting a viable pricing and sales model
Attitudes	Trust in technology, barriers to switching, awareness of EE benefits	Guides education-based marketing and onboarding strategies

Herein the illustrative ideal customer profiles examples:

Category	B2B – Textile Factory	B2G – DOIT	B2B – 4–5 ★ Hotel
Title / Role	Plant Manager	Deputy Head of Energy Efficiency, DOIT	General Manager, 4 ★ Hotel
Customer Type	B2B (Industrial)	B2G (Government)	B2B (Commercial Real Estate)
Basic Information	Export-oriented textile manufacturer; 2,000 workers; 3 workshops	Oversees >200 key energy-using entities	200 rooms, 15 floors, 70% international guests; annual electricity cost >3B VND
Organizational Goals	Reduce costs, meet EU green standards	Implement VNEEP3, PDP8, monitor key energy-using entities	Reduce electricity bill, improve guest experience, achieve LOTUS/EDGE

Category	B2B – Textile Factory	B2G – DOIT	B2B – 4-5 ★ Hotel
Personal Goals	Maintain ISO 50001, reduce downtime	Achieve minimum 10% energy savings	Increase occupancy, retain corporate/inter-national clients
Definition of Success	≥15% cost reduction in 2 years; achieve green certification	Evidence-based reporting; minimal complaints	20% energy savings, fewer comfort complaints, achieve LOTUS certification
Key Challenges	Old machinery; energy = 18% of total cost	Lack of digital data, low enterprise cooperation, limited manpower	Aging HVAC systems; energy = 40% of OPEX; guest comfort complaints
Current Solutions Used	Periodic audits, compressor replacement	Paper/Excel reporting, ESCO contracts	Manual AC scheduling, partial LED upgrades
Trust in New Technology (1-5)	3/5 – requires proven pilot	4/5 – if budget support is available	4/5 – willing if payback <3 years
Reference Sources	VITAS, MOIT, industry fairs	MOIT documents, national conferences, ADB/GIZ	Tourism associations, OTAs, conferences; LOTUS/EDGE consultants
Decision Maker	Board of Directors + CFO	Director of DOIT, Provincial People's Committee	General Manager / Property Owner
Influencers	Head of Engineering/Maintenance	Finance Department, provincial authorities	Chief Engineer, Technical Manager, international guests (CSR requirements)

Category	B2B – Textile Factory	B2G – DOIT	B2B – 4–5 ★ Hotel
Relevant Budget	5–10B VND/year for energy/ESG	Project-based, provincial or ODA funding	2–5B VND/year for retrofit/ESG
Decision Cycle	Annual, Q4	Annual, aligned with state budget cycle	Flexible, depends on tourist season & owner approvals
Expectations	ROI <24 months; ≥15% savings	Province-wide EE monitoring; automated VNEEP3 reporting	ROI <36 months; ≥20% savings; improved ESG rating
Pilot Readiness	Yes – free or co-funded	Yes – within cooperation framework	Yes – if minimal guest impact; free or subsidized
Compliance Priorities	ISO 50001, QCVN, ESG	MOIT, QCVN, ESG, national reporting	LOTUS, EDGE, LEED, ISO 14001
Effective Message	“Cut electricity costs by 20% within 18 months – no upfront CAPEX.”	“Comprehensive energy monitoring with transparent VNEEP3 reporting.”	“Reduce electricity costs & upgrade green rating – boost occupancy & international guests.”
Effective Channels	Textile-industry workshops, vendor referrals	ODA projects, MOIT conferences, international partners	Green hotel events, tourism associations, certification consultants
Trust-Building Requirements	Proven pilot cases, similar factory references	Endorsement from MOIT, inter-provincial pilots	Peer hotel testimonials, savings data, green certifications

Table 42: Match Research Methods to Startup Lifecycle Stage

Lifecycle Stage	Typical Objectives	Practical Research Tools & Tactics
Pre-launch / Idea Validation	Identify real needs, test problem-solution fit, set pricing, map competitors	• Interviews with facility/energy managers • Secondary research (e.g., EVN, VNEEP reports) • Focus groups • Market sizing estimations
Early Growth	Identify high-performing channels, optimize messaging, improve retention	• Channel testing via digital campaigns • Customer feedback loops (e.g., NPS surveys) • Pilot project analysis
Maturity / Plateau	Refine brand positioning, segment users, expand upselling	• Customer segmentation research • Brand audits (e.g., perception vs competitor) • Churn analysis
Decline / Diversification	Explore new verticals or geographies, product pivots	• Market Opportunity Navigator • Market expansion surveys • Feasibility studies for adjacent solutions

Tips:

Use free or low-cost tools—like Google Forms, Typeform, Facebook Ads A/B tests, or LinkedIn polls—to gather fast insights.

Table 43: Types of Data: When and Why to Use

Type of Research Data	Best For	Typical Time Investment	Sample Size (Suggested)	Practical Example in EE Context
Primary Data	Getting direct user insights, testing assumptions	Days to Weeks	5 – 500+ people	Interviews with facilities managers about cooling system upgrades
Secondary Data	Understanding trends, market size, policy context	Hours to Days	N/A	Using MONRE/MOIT/EVN reports to estimate commercial building EE potential
Qualitative Data	Exploring motivations, concerns and adoption barriers	Days to Weeks	5 – 30 people	Focus groups on perceived risk of retrofitting existing infrastructure
Quantitative Data	Validating hypotheses with statistical significance	Weeks	100 – 1,000+ people	Survey measuring willingness to pay for an EE subscription service

Table 44: Data Strategy by Life Stage

Life Stage	Primary Data	Secondary Data	Qualitative Insights	Quantitative Use Case
Idea / Pre-MVP	Pain point interviews, pricing surveys	Policy and industry reports	Explore skepticism toward EE payback timelines	Survey on how much % energy savings trigger action
Pilot / Early Adoption	Feedback from demo projects	Benchmarks from local/ASEAN peers	Test reactions to product messaging and value prop	Survey to validate product-market fit (NPS)
Scale-Up	Post-purchase interviews, onboarding UX	Cost-benefit case studies	Retention barriers or channel friction	A/B testing on channel conversion or ad spend ROI

Tips:

Before spending months building a platform or prototype, test your idea with 5–10 interviews and a simple landing page. That alone can reveal whether there's demand—and it's what investors want to see first.

8.1.2 Competitive Landscape

Unlike internal innovation teams in large corporations, EE startups face unique challenges: limited resources, pressure to validate solutions quickly, and the need to win trust in a highly technical and often conservative market. Understanding your competitive landscape helps position your startup to succeed by proactively identifying where you can stand out. To thrive, your startup must understand not only who your competitors are, but also the industry forces that influence your ability to grow, attract investment, and deliver long-term value.

Analyzing Industry Forces Using Porter's Five Forces: One of the most effective ways to gain a holistic view of your market is through Porter's Five Forces—a strategic framework that evaluates the intensity of competition and attractiveness of a market.

Table 45: Analysing Industry Forces Using Porter's Five Forces

Force	What to Ask	Implications for EE Startups
Threat of New Entrants	How easily can new players enter the market?	EE solutions with low upfront cost or SaaS models may attract many copycats. Protect your IP, build brand credibility early.
Bargaining Power of Suppliers	How much control do suppliers (e.g., hardware vendors) have over cost, quality, and lead time?	EE startups reliant on imported sensors, control systems, or specialized components may face pricing pressure and delivery delays. Seek diversified or local suppliers where possible.
Bargaining Power of Buyers	How much leverage do customers (e.g., factories, building owners) have in negotiations?	Customers—especially in B2B settings—may demand discounts, long payment terms, or customized features. EE startups must be flexible, while maintaining unit economics.
Threat of Substitutes	Are there non-technological or cheaper alternatives?	Behavior change campaigns, manual energy audits, or outdated equipment upgrades may be seen as cheaper options. Your product must clearly prove superior ROI and convenience.
Industry Rivalry	How intense is competition among existing players?	In Viet Nam, many EE firms operate in silos with overlapping offerings. Strong differentiation and customer education are key to rising above the noise.

Mapping Direct and Indirect Competitors: For EE startups, competitors may include not only other tech startups, but also:

- Traditional ESCOs (Energy Service Companies) offering bundled solutions
- Technology integrators or EPCs providing end-to-end systems
- Importers/distributors of foreign EE devices or software
- Green building consultancies that include EE as part of their portfolio
- Do-nothing behavior – when potential customers prefer inaction over change

Create a competitive matrix to benchmark these players based on:

Table 46: Competitive matrix

Factor	Solution	Market Competitors
Product/Service Focus	Smart lighting retrofit	• HVAC optimization • Real-time energy monitoring
Target Market	Small and medium-sized manufacturing enterprises	• Commercial buildings • Hospitals and public facilities
Value Proposition	Guaranteed 15% energy savings with no upfront cost	• ISO 50001 alignment • Data analytics and dashboard visualization

Factor	Solution	Market Competitors
Pricing Model	Pay-as-you-save	• ISO 50001 alignment • Data analytics and dashboard visualization
Customer Pain Points Addressed	High lighting energy bills but no budget for upgrades	• Compliance requirements • Lack of internal energy data
Weaknesses	Limited pilot projects	• Expensive for SMEs • Complex user interface, difficult for new users

Tips:

Use this matrix to identify where your product uniquely solves a pain point others ignore (Are competitors failing to serve Tier-2 provinces? Do they overlook mid-sized industrial clients? Do they focus too much on hardware, and not enough on user experience or data insights?)

Finding Your Strategic Opportunity: The goal isn't to beat every competitor—it's to find the space where your EE startup can win. Look for:

- White space in market segments (e.g., SME factories in secondary cities)
- Untapped business models (e.g., leasing EE equipment with maintenance bundled)
- Under-addressed use cases (e.g., smart monitoring for agricultural cold chains)
- Policy tailwinds (e.g., customers needing support to meet energy intensity targets)

Tips:

Don't forget: indirect competitors—like consultants, DIY solutions, or in-house facility teams—can be direct product rivals. Evaluate how well your startup communicates why switching to your solution makes more sense.

8.1.3 Positioning Framework

Once you've mapped your competitors and identified market gaps, the next step is to position your startup to stand out.

Positioning defines where your startup fits in the market: what value you offer, who you serve, and what sets you apart. This will guide you from developing messaging and pricing, to your product roadmap and go-to-market approach.

Value Proposition is a key part of positioning. It's your core promise to customers: a clear, concise statement of how your solution addresses their needs and delivers tangible benefits. One effective way to build this is through the Value Proposition Canvas, which includes two main elements

Table 47: Value Proposition Canvas

Component	Description
Customer Profile	Outlines the customer's jobs (tasks to complete), pains (challenges), and gains (desired outcomes). For example, a factory energy manager may want to reduce electricity bills (job), struggles with outdated monitoring systems (pain), and
Value Map	Describes how your product creates specific gains and relieves specific pains through its features and services. For example, your EE solution may offer plug-and-play sensors, automated alerts, and monthly energy savings reports.

Tips:

- *Avoid technical jargon, focus on benefits (e.g., "save 20% on cooling costs")*
- *Make it measurable*
- *Revisit and refine your value proposition as you gather feedback*

Unique Selling Point (USP): After defining your Value Proposition, what you solve and why it matters, the next step is to crystallize your Unique Selling Point (USP): what makes your solution stand out in a crowded market.

In the energy efficiency space, many products offer similar functionalities—LED retrofits, BMS dashboards, optimization software. What makes your solution stand out? Your USP is the one thing you do better, faster, cheaper, or more credible than competitors—and that your customer actually cares about.

Examples of EE startup USPs:

- “Pay-as-you-save lighting retrofit—no upfront investment”
- “Designed for tropical factories—real-time heat load adjustment”
- “Compliant with ISO 50001 and Decision 280 energy audit formats”

A strong USP enables:

- Easier investor conversations
- Sharper marketing and sales messaging
- Greater internal alignment on what makes your startup special

Use the “USP Positioning Matrix” to find your winning zone:

Table 48: USP Positioning Matrix

Zone	Meaning	Action
Winning Zone	You solve a real customer problem better than anyone else	Focus here. Build brand around this edge
Losing Zone	Competitors are stronger in solving a key customer need	Avoid—too hard to compete
Risky Zone	You and competitors offer similar benefits. You and competitors offer similar benefits	Stand out through UX, pricing, partnerships, or speed
Who Cares Zone	Feature or benefit that isn't valued by the customer	Eliminate or deprioritize it

Activate Your Positioning – Make It Real: A strong value proposition and USP are only effective if consistently applied.

Step	What to do
Make it Visible	Put your USP and core value proposition where your team and customers can see it—website, pitch deck, email signature, product UI, and office walls. Repetition builds clarity and conviction.
Live it Daily	Let your positioning guide product decisions, hiring, customer service, and branding. Consistency builds trust and helps your startup grow with intention.
Test & Refine	Positioning is not static. As your market matures or customer needs shift, continuously test what resonates and adjust. Ask: Are we still solving the most painful problem in the best way?

In Viet Nam’s fast-evolving but still fragmented EE market, clarity and credibility matter. A well-defined position can help your startup stand out in a crowded field.

Tips:

Don’t treat your USP and value proposition as static marketing statements. Embed them in your culture, communications, and daily operation.

8.2 Customer Journey⁹⁶ & Conversion Funnel⁹⁷

Customer acquisition is the process of turning a qualified lead into a paying customer through structured engagement, trust-building, and performance validation.

For EE startups, especially those targeting B2B and B2G markets, the process tends to be slower and more complex than in typical consumer startups. Long sales cycles, technical evaluations, stakeholder buy-in, and procurement constraints mean that founders need to approach acquisition as a coordinated effort across marketing, sales, and service delivery.

In this section, we outline how startups can align educational content, outreach channels, and sales tools to guide potential customers along a defined journey: from awareness to action.

Goal: Move customers from interest -> purchase through well-defined steps.

⁹⁶ Customer journey is the end-to-end process that a customer goes through from the moment they recognize a need to the point of purchasing and using a product, typically spanning the stages of awareness, consideration, decision, and retention.

⁹⁷ Conversion funnel is the process of tracking and optimizing user behavior from the initial interaction to the completion of a desired action, such as signing up, making a purchase, or completing a payment.

8.2.1 Customer Journey Strategy & Conversion Funnel in EE

Once you've defined your market and positioned your startup, the next step is to map a clear path to conversion.

The conversion funnel is beyond a marketing tool, it is a strategy that allows energy efficiency startups to design a smarter customer journey and engage with confidence.

Why It Matters for EE Startups: The EE sales cycle is often longer and involves more stakeholders (technical, financial, operational). A structured acquisition process:

- Helps avoid wasted leads
- Aligns marketing and sales teams
- Increases the chance of successful pilots and revenue conversion

Below is a summary table outlining this journey across the four key stages of the conversion funnel

Stages of the EE Conversion Funnel:

- **Top-of-Funnel (TOFU):** Share educational content on EE, return on investment (ROI), and relevant policies; engage potential customers through community workshops and educational outreach campaigns.
- **Middle-of-Funnel (MOFU):** Provide customized ROI estimates, cost-benefit simulations, and testimonials from local businesses to build credibility and relevance.
- **Bottom-of-Funnel (BOFU):** Ensure transparent contracting processes, support initial implementation or installation, and deliver strong post-deployment customer service.

Table 49: Four main Stages of the EE Conversion Funnel

Stage	Customer Behavior	Business Goal	Key strategies	TOFU/ MOFU/ BOFU
Awareness	- Customers begin exploring their needs - Discovering brands and products - Not ready to buy yet	- Capture attention - Increase brand awareness	- Educational content (blogs, videos, webinars) - Engaging social media posts - SEO & EE-related keywords - Partner with EE organizations/events	TOFU
Interest	Identified their needs Actively researching and comparing solutions Interested in the brand	Engage potential customers Provide in-depth content	Detailed product information Customer testimonials Free trials or demos Email newsletters First-time subscriber discounts	MOFU
Desire	- Considering purchase - Evaluating trust and credibility - Looking for reasons to choose the b	- Build trust - Motivate purchase intent	- Transparent communication - Highlight product benefits and unique features - Personalized emails - Product recommendations - Exclusive offers	MOFU

Action	• Ready to purchase • Has evaluated and decided	• Optimize conversion • Encourage final action	Simple checkout process • Multiple payment options • Responsive technical support • Post-purchase email (confirmation, gratitude, cross-sell suggestions)	BOFU
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Tips:

Map out your Customer Acquisition Funnel using real examples from past outreach, and track conversion rates at each stage. This turns marketing activity into measurable revenue impact.

8.2.2 Educational Content Strategy

Once an Energy Efficiency (EE) startup has clearly defined its market position, and mapped where its users are conversion funnel, the next step is customer education⁹⁸.

EE solutions are often technical, long-term, and unfamiliar to many. Without proper understanding, potential clients might hesitate or decline your proposals. Proactive, well-targeted educational content can help overcome this barrier and accelerate decision-making.

Educational Content Formats: For EE startups, educational content is a core driver of market traction long-term success. The formats below illustrate how education can be embedded throughout the customer journey:

98 Customer education is the process of providing knowledge and guidance that helps customers understand, use, and fully extract value from a product or service.

199

Table 50: Educational Content Formats

Format	Funnel Stage	How It Supports EE Startups	Practical Example
Marketing-Focused Educational Content	TOFU -> MOFU	Educational content used in marketing helps build trust with potential customers, highlight unique value propositions, and increase conversion rates. It translates technical features (e.g., “35% energy savings”) into customer-relevant outcomes (e.g., “saves VND 25 million/year on electricity”).	A startup offering building insulation shares a video series comparing monthly energy bills before and after insulation retrofits, reinforced with a “How It Works” infographic.
Sales Enablement Education	MOFU -> BOFU	Sales teams need educational assets to explain the technical and financial value of EE solutions in a way that resonates with different stakeholders (e.g., CFOs, facility managers). Training and content help overcome objections and build credibility.	A startup preparing for commercial tenders develops a set of one-pagers showing ROI timelines, GHG savings, and typical case studies, helping sales reps win over procurement officers and technical staff.
In-Product Education (IPE)	BOFU Retention ->	EE solutions—like monitoring platforms or control systems—often require users to take specific actions. IPE ensures users get step-by-step guidance at the exact moment of need. This increases usability, reduces frustration, and improves long-term engagement.	A smart metering app displays a pop-up tutorial explaining how to interpret peak load charts, with a link to a video on reducing consumption during peak hours.

Tips:

Your educational content should evolve alongside your product. As features grow and customer sophistication increases, update your materials to stay relevant. Consider hosting quarterly feedback calls or webinars with existing users to identify knowledge gaps and co-develop new formats with them.

8.3 Outreach Channels & Customer Education

Energy-Efficiency (EE) Startups must select customer acquisition channels based on the technological maturity of their product and the customer's decision-making stage. The channels below are organized along the journey from awareness to decision, enabling Startups to navigate their Go-to-Market strategy systematically. Each channel includes its objectives, target audience, and implementation approach, and is linked to a practical list of ecosystem partners to facilitate immediate action.

8.3.1. Offline Channels – Building Trust and Driving Conversion

- Industry workshops and conferences (B2B/B2G – Awareness): Participate in exhibitions or host proprietary workshops/events to demonstrate the solution. This is the most effective channel for explaining complex technologies and establishing initial credibility.
- Community engagement & local partner networks (B2C/B2G – Interest): Reach cautious or underserved customer groups through community-based activities, leveraging existing trust and local networks.
- Specialized seminars (Webinars) / Live demonstrations (B2B/B2C – Consideration): Illustrate value through practical case studies, panel discussions, and Q&A sessions. These help reduce perceived complexity and “humanize” the product.
- 1–1 advisory / Direct sales (B2B – Decision): Focus on diagnosing pain points, clarifying specific needs, and profiling the customer to reach commercial agreement and close deals. This is particularly critical for clients such as manufacturing plants, industrial facilities, commercial buildings, and industrial parks.

8.3.2. Digital Channels – Demand Generation and Lead Nurturing

- SEO-optimized content & lead magnets (B2B/B2C – Awareness -> Consideration): Articles such as “Five ways to reduce energy losses in manufacturing plants” help attract high-quality leads actively seeking EE solutions.
- Google Ads – online advertising (B2B/B2C – Awareness): Target pain-point-driven keywords (e.g., reducing electricity bills, operational optimization), suitable for markets with established search intent.

- Email marketing (B2B/B2C – Interest -> Decision): Automate lead nurturing through case studies, product updates, and promotional offers.
- Social media (B2B/B2C – Awareness -> Interest): Short-form videos, infographics, and livestream Q&A sessions enable rapid reach, experimentation with messaging, and credibility building.

8.3.3. Public-Sector & Institutional Channels – Strengthening Validation and Piloting Capacity

- PR/Media/Awards (B2B/B2C/B2G – Awareness): Earned media and EE-related awards strengthen legitimacy, especially for emerging or unfamiliar technologies.
- Academic/Government/NGO partnerships (B2B/B2G – Interest -> Decision): Co-develop pilot projects, secure endorsements, unlock grants, or obtain institutional facilitation. Well-suited for pilots in schools, industrial zones, and public buildings.
- School campaigns / volunteer programs – Corporate Social Responsibility (B2C/B2G – Interest): Raise public awareness and build long-term positive sentiment.
- Participation in standards and incentive programs (B2B/B2G – Retention): Access financial incentives, certifications, and ongoing performance monitoring post-deployment.

To support practical implementation, a detailed list of each channel, illustrative examples, and relevant organizations/partners is included in the Appendix. Readers may refer to the Appendix to select the most suitable channels based on product context, available resources, and the maturity level of their EE Startup.

Engaging and educating target customers is not merely a communication exercise; it is the delivery of the right message, at the right moment, through the most effective channels. For EE Startups, strategically selecting customer acquisition channels is essential to accelerating product adoption, strengthening credibility, and building long-term engagement with stakeholders.

Goal: Deliver the right message to the right people at the right time.

8.4 Sale Enablement & Lead Conversion

Once awareness and interest have been established, the sales process kicks in to convert qualified leads into paying customers. This process needs tailoring to specific consumer behavior of B2B, B2G, or B2C markets.

In the Energy Efficiency (EE) space, sales cycles are often long and require multiple layers of trust and validation. In this space, customers want to understand what they're paying for and how soon they'll see results. Sales conversations must address these concerns directly, backed by credible data and thoughtful engagement.

This section lays out how startups can shape a conversion journey that fits both their target segment and stage of growth.

Goal: Convert qualified leads into paying customers through structured, trust-based sales steps.

Step	Purpose	Example in EE
Qualify the Lead	Assess whether the customer has need, urgency, budget, and decision-making authority.	Factory manager expresses concern over high cooling bills and is open to audits.
Initial Demo / Consultation	Educate the customer, show technical feasibility, and explore business case.	A demo of the dashboard + energy-saving estimates tailored to their equipment.
Pilot or Trial Offer	Offer a low-risk test to prove value.	1-month trial with free sensors to track energy use and show baseline inefficiencies.
ROI Framing & Custom Proposal	Frame benefits in clear numbers: cost savings, payback period, CO2 reduction.	Proposal shows 12-month payback, 18% energy reduction, certified by 3rd party.
Address Objections & Build Trust	Anticipate concerns (technical risk, cost, disruption) and use credibility levers.	Anticipate concerns (technical risk, cost, disruption) and use credibility levers.
Close & Contract	Keep contracts simple, transparent, and aligned with buyer needs.	Use performance-based terms or “pay-as-you-save” model if budget is limited.
Post-Sale Support	Smooth onboarding and early results reinforce trust and lead to expansion or referrals.	Dedicated support to help optimize settings, track energy saved in real time.

Tips for EE Startups:

- **Lead with value, not technology.** Most customers care more about cost savings and compliance than technical specs.
- **Visual sells:** use graphs, dashboards, or before–after charts to show energy savings.
- **Speak their language:** C-suite wants ROI, facility managers want ease-of-use, procurement wants trust.

Table 51: Sales Enablement Checklist for EE Startups

Do you have...?	☒
A clear Value Proposition document customized for each customer segment?	
A short, visual pitch deck with energy savings, ROI, and use cases?	
A set of FAQ answers for common objections (cost, downtime, credibility)?	
A list of past pilot results or case studies to build confidence?	
A proposal template that includes financial and environmental metrics?	
A sales script or checklist for initial consultations or facility walkthroughs?	
Clear follow-up emails and next-step templates after each meeting/demo?	

8.5 Building Trust and Reputation

In the energy efficiency (EE) sector, establishing a reputation for credibility, transparency, and impact is key to long-term success

This section outlines proven strategies for building and reinforcing that trust—through pilot projects, testimonials, third-party endorsements, and consistent brand behavior—so that your startup can move from being a promising idea to a trusted market player.

Goal: Earn credibility to unlock pilots, sales, and partnerships.

8.5.1 Engagement Strategies

Engagement Strategies: Building trust from the start is crucial for EE startups—especially when solutions require upfront investment and technical validation. The strategies below help startups attract, convince, and retain customers through credibility-building approaches tailored for the EE context.

Strategy #1 - Pilot Programs (Free Audits or Demos): Offering complimentary energy audits or product trials allows potential customers to experience real value with minimal risk. These pilots can:

- Build trust by demonstrating transparency and performance
- Generate real-world data to improve your solution
- Lead to long-term partnerships or larger contracts when ROI is proven
- Create advocates who promote your solution through testimonials or referrals

Tip: Collaborate with SMEs, or industrial zones for low-cost pilots. Use the results (e.g. % energy saved, payback period) as success cases.

Strategy #2 - Customer Testimonials: In EE, where decisions are often risk-averse, customer testimonials act as powerful social proof. These can:

- Showcase results in relatable language
- Build credibility through stories of cost savings or efficiency gains
- Be used across channels—websites, brochures, webinars, or investor decks

Tip: Start by collecting testimonials from early adopters such as small factories, schools, or commercial buildings. Feature their logos, photos, or energy data (with permission). When working with government-related clients (e.g., DoITs), co-brand the testimonial with their endorsement to maximize visibility and trust.

Strategy #3 - Peer Referrals: Satisfied customers can become your most trusted marketing channel. Referrals are highly effective because:

- They carry trust from real-life relationships
- Prospects are more likely to convert when referred by peers
- Startup resources are limited—referrals scale organically

Tip: Build a referral program that rewards users for successful introductions—such as a discount or free service credit. It builds loyalty and community at the same time.

Strategy #4 - Endorsements from Reputable Institutions: Gaining support or recognition from trusted entities helps de-risk your solution in the eyes of potential customers. Options include:

- Partnering with public agencies for joint pilot programs
- Earning certifications (e.g., ISO 50001, EE labeling)
- Participating in endorsed incubators or national programs

Tip: *Engage with MOIT (VNEEP3 office), VEEN, NIC, SIHUB, or VGBC for co-branding, technical backing, or program inclusion. Their endorsement signals trustworthiness and quality.*

8.5.2 Building Brand Trust

Establishing and maintaining trust is foundational for early-stage startups — particularly in sectors like energy efficiency, where solutions are technical, long-term, and often require upfront investment. This section outlines three strategic pillars for building and reinforcing brand trust: credibility, thought leadership, and consistent messaging.

8.5.3. Credibility Builders

Demonstrating credibility through third-party validation, regulatory alignment, and verifiable performance metrics increases customer confidence and improves access to funding, partnerships, and pilot opportunities.

Certifications and Standards: Achieving formal certifications—such as ISO 50001 (Energy Management Systems), LEED, or Viet Nam’s national Green Building and Energy Efficiency Codes—positions your startup as technically competent and regulation-compliant. These certifications demonstrate that your solution meets measurable performance standards, which is particularly important in government procurement and ESG-focused investment.

In Viet Nam, compliance with energy efficiency regulations (e.g., under VNEEP or local DoIT guidelines) strengthens your startup’s reputation as a lawful and responsible partner, and may unlock pathways to public sector support.

Tips:

Start with certifications that match your business stage and target customers. For example, if selling to large commercial users, ISO 50001 or green building codes may be required. For residential solutions, seek inclusion in local energy-labeling or rebate schemes.

Endorsements from Trusted Institutions: Securing endorsements or collaborations with recognized institutions—such as MOIT, the World Bank, ADB, or leading universities—boosts your startup’s legitimacy. These institutions are widely trusted and their support can help open doors to policy dialogues, investment funds, or pilot project calls under national and international programs.

Even letters of support, technical reviews, or pilot co-hosting agreements from credible institutions can go a long way in convincing skeptical partners and investors.

Tips:

Reach out to government programs (e.g., VNEEP), university labs, or NGOs active in green energy for collaborative pilots, joint research, or endorsement letters. Align your solution with their goals (e.g., cost savings, emissions reduction).

Verified Impact Data: Providing hard, independently validated data is one of the most persuasive ways to build trust. Metrics like:

- % energy savings compared to baseline
- Payback period in months
- Tons of CO2 avoided annually
- Reduction in electricity bills

...are particularly compelling when verified by third-party institutions, academic partners, or customer case studies.

Transparent and evidence-based reporting makes it easier for public buyers, donors, or businesses to justify investment or adoption.

Tips:

Design your pilots to collect usable performance data from day one. Partner with an independent evaluator (e.g., university, ESCO, or NGO) to lend credibility. Use visual dashboards, infographics, or before-after comparisons to make results easy to digest.

8.5.4. Thought Leadership

Establishing thought leadership¹⁰⁰ allows EE startups to build credibility and actively shape the conversation around energy efficiency. Below are key pathways to becoming a trusted voice in the ecosystem.

Publishing Research: Publishing original research or insights in academic journals, industry blogs, or technical magazines can position your startup as a knowledge leader. Whether you’re presenting a new energy-saving methodology, a pilot case study, or a

100 A thought leader is an individual or organization with deep expertise in a specific field who is highly respected, consistently referenced, and closely followed by peers, customers, and even competitors.

comparison of technologies, sharing well-researched content demonstrates technical depth and commitment to advancing the field.

Tip: Start with industry-friendly outlets. Collaborate with a university or research center for joint authorship and added credibility.

Participating in Industry Panels and Roundtables: Engaging in sectoral events—such as clean energy conferences, government consultations, or expert webinars—gives startups a platform to share their experiences and influence future standards. These forums also provide valuable visibility and networking with potential investors, customers, and policymakers.

Tip: Begin by attending sessions, then apply to be a panelist, exhibitor, or speaker. Tailor your message to highlight real results, innovation, or lessons from on-the-ground pilots in Viet Nam.

Producing Podcasts or Video Series: Audio-visual formats like podcasts, YouTube series, or LinkedIn Lives make it easier for startups to communicate complex ideas in a relatable way. These channels allow you to tell behind-the-scenes stories, explain your tech in plain language, or interview collaborators—helping your startup connect emotionally while educating audiences.

Tip: Keep episodes short (5–15 mins), visually clear, and focused on 1 topic. Repurpose clips for marketing, onboarding, or investor updates.

Example: *Wiser, a UK-based smart heating company, runs a branded YouTube channel featuring how-to videos, product explainers, and smart energy tips—reinforcing its expertise and approachability.*

Mentoring or Collaborating with Universities: Building relationships with academic institutions not only strengthens your startup's R&D capabilities but also enhances your credibility as a knowledge-driven enterprise. Joint research projects, student-led innovation challenges, or guest lectures allow your startup to shape future talent while showcasing your commitment to innovation and education.

Tip: Approach university energy clubs, EE departments, or innovation hubs (e.g., SIHUB, NIC) to co-host hackathons, run capstone projects, or trial prototypes in campus buildings.

8.5.5 Consistent Brand Messaging

Consistent brand messaging is a trust-building mechanism that signals professionalism and clarity. In a competitive and often technical market, customers must instantly recognize what your brand stands for—and why it matters to them. Maintaining consistency across all communication and customer touchpoints helps your startup:

- Earn trust and foster loyalty: A clear and coherent brand builds emotional connection and customer confidence.

- Stand out in the market: Cohesive messaging differentiates you from competitors, especially when communicating complex EE solutions.
- Reinforce your leadership: Repetition of key visuals, tone, and values solidifies your authority in the eyes of stakeholders

When customers associate your brand with positive, repeated experiences—online and offline—they’re more likely to purchase, advocate, and return.

Visual Identity: Your visual identity is often the first thing customers notice. It includes your logo, color palette, typography, and layout style across platforms (website, packaging, pitch decks, social media, etc.). Inconsistencies confuse the audience and diminish trust.

Tip: *Develop a brand style guide early. This helps maintain visual consistency, especially as your team grows or engages external partners.*

Example: NEXT Energy Technologies (www.nextenergytech.com) uses a bold yellow-on-blue wordmark to evoke sunlight, innovation, and clarity. The clean, modern design reflects their mission of turning windows into solar power generators and reinforces a forward-looking, sustainable brand identity.



Messaging and Tone: Your voice—how your brand “speaks”—should be just as recognizable as how it looks. Whether technical or inspirational, formal or friendly, your tone needs to be consistent across all content: ads, emails, social posts, or investor decks.

Tip: *Anchor your tone in your brand personality. Are you a “trusted advisor”? A “clean-tech rebel”? Align tone with your mission and target audience.*

Example: BlocPower (www.blocpower.io), an EE retrofitting startup, uses the slogan:

“Transform buildings. Strengthen communities. Build long-term value.”

This message speaks on three levels:

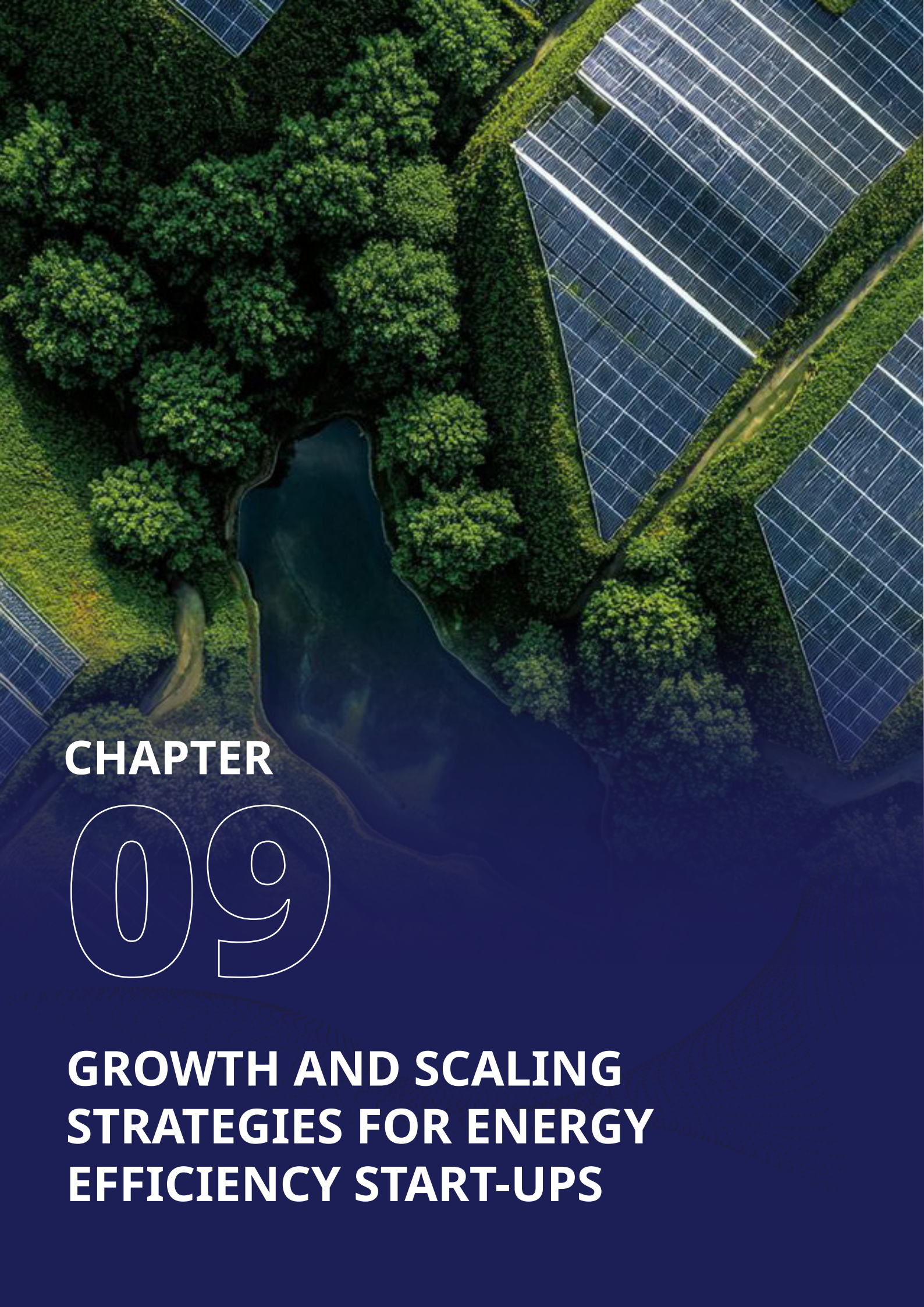
- Functional: Improving infrastructure with clean technology.
- Social: Empowering communities and reducing energy inequality.
- Strategic: Delivering lasting economic and environmental returns.

Their voice is clear, inclusive, and impact-driven—perfect for investors, cities, and underserved communities.

Customer Experience: Every interaction—from how your sales team responds to emails, to the usability of your website—shapes brand perception. Especially in the EE sector, where customers may be skeptical or require technical support, a consistent experience builds lasting confidence.

Tips:

- *Start local: Identify 2–3 priority organizations that align with your EE solution and approach them early for collaboration or pilot validation.*
- *Build a strong profile: Prepare a clear and credible one-pager or pitch deck with proven or potential EE impact (e.g., % energy saved, ROI).*
- *Leverage events: Use industry expos, VNEEP3 events, or chamber events as platforms to showcase your innovation and attract strategic partners.*

An aerial photograph showing a large solar farm with rows of blue photovoltaic panels on the right side. To the left of the solar panels is a dense green forest. In the center, a small, dark pond is nestled within the forest. The bottom half of the image is overlaid with a dark blue gradient containing white text.

CHAPTER

09

**GROWTH AND SCALING
STRATEGIES FOR ENERGY
EFFICIENCY START-UPS**



CHAPTER 9. GROWTH AND SCALING STRATEGIES FOR ENERGY EFFICIENCY START-UPS

Scaling is essential for turning promising EE innovations into impactful, sustainable businesses. For EE startups in Viet Nam, a clear growth strategy matters for four key reasons:

- **Maximizing Impact:** Scaling allows EE solutions to reach more users, reduce more emissions, and contribute meaningfully to national goals like VNEEP3 and net-zero commitments.
- **Staying Competitive:** Early scaling helps secure a first-mover advantage, attract talent and investment, and build credibility in an increasingly crowded market.
- **Ensuring Financial Viability:** Growth enables startups to streamline operations, reduce customer acquisition costs, and move toward profitability through larger contracts or recurring revenue.
- **Meeting Market Expectations:** Government and industry actors in Viet Nam are prioritizing scalable, replicable solutions. Startups that can demonstrate growth readiness are more likely to access support and partnership opportunities.

TIP: Scaling isn't just about expanding your customer base—it can also mean entering new sectors (e.g., from buildings to industry), replicating in other cities, or deepening value with existing clients.

In short, scale is the bridge between innovation and systemic change. Without it, even great ideas may stall. With it, startups can lead Viet Nam's green transformation.

9.1 Are You Ready to Scale?

A Practical Readiness Assessment for EE Startups: Before launching into an ambitious scale-up, EE start-ups must critically assess whether they are truly ready. Scaling too early—without a solid foundation in product, market, team, and finance—can lead to wasted resources, quality issues, or even collapse. On the other hand, delaying scale when market signals are strong may mean missing out on valuable growth opportunities.

This concept of Scaling Readiness¹⁰¹ emphasizes the need for structured, evidence-based self-evaluation to determine whether your innovation and enterprise model are ready for broader market replication. It's not just about having a good product—it's about delivering it reliably, sustainably, and at scale

101 Scaling Readiness was developed by the CGIAR Research Program on Integrated Systems for the Humid Tropics. See: CGIAR (2015). Scaling Readiness: A framework for assessing readiness and guiding scaling of innovations. <https://www.cgiar.org/research/publication/scaling-readiness/>

The following 10-point scorecard is a diagnostic tool to help you evaluate your startup's scale-up readiness. Each "Yes" scores 1 point. A score of 7 or higher suggests a strong foundation to move forward, though any "No" signals an area needing attention.

Table 52: Scaling Readiness Scorecard for Energy Efficiency Startups

Category	No.	Question	Yes (1) / No (0)	Evidence / Key Considerations
Product	1	Is your core EE product/service fully developed, tested, and delivering consistent, verifiable value (e.g., energy savings, CO2 reduction) to early users?		Tangible results, verified energy savings, validated use cases.
	2	Does it have a clear technological edge or USP that is hard to replicate?		Competitive moat, IP protection, or unique performance advantages.
Market	3	Have you defined and validated a target market with strong growth potential?		Market research completed, clear customer segments, evidence of demand.
	4	Do you have product-market fit—proven by real usage, positive feedback, and willingness to pay?		Retention, referrals, and repeat purchases among initial customers.

Category	No.	Question	Yes (1) / No (0)	Evidence / Key Considerations
Team	5	Does your leadership team have—or plan to acquire—the skills to scale operations, sales, and finance?		Team has relevant experience, strategic hires underway, strong founder alignment.
	6	Are responsibilities clearly defined and cross-functional coordination in place?		Operational clarity, inter-departmental collaboration.
Finance	7	Do you understand your unit economics (CAC, LTV, gross margin) and have a scalable financial model?		Profitability pathway at scale, validated cost structures.
	8	Do you have enough funding (or a clear plan to secure it) to support scale-up efforts (e.g., hiring, inventory, expansion)?		12–18 months of runway, active fundraising strategy.
Operations	9	Are your core processes (e.g., deployment, onboarding) scalable without increasing cost and complexity proportionally?		SOPs, automation potential, partner-readiness.
Total Score			/10	Recommendation: ≥ 7 to begin scaling efforts.

Achieving a score of 7 or more means your startup likely has a sound basis to begin scaling. However, any areas that scored 0 should be treated as strategic priorities before scaling up.

Tip: Don't rush into scale. Even strong startups may need to reinforce back-end systems or talent pipelines before expanding aggressively.

For EE startups, readiness is more than having a good idea—it's about building a scalable, trusted, and resilient operation that can grow without compromising on quality or value

9.2 Strategic Scaling Paths: Choosing How to Grow

Once an EE start-up has confirmed its readiness to scale—with a validated product, growing customer demand, a capable team, and sound financial footing—the next step is to determine the most appropriate scaling path. Scaling is not simply about growing bigger; it's about growing strategically and sustainably.

There is no universal formula for scaling. The right approach depends on several factors, including the maturity of the product, the structure and dynamics of the target market, internal team capacity, and available resources. Each start-up must carefully evaluate which path best aligns with its capabilities, customer needs, and long-term vision.

This section introduces and compares three widely used strategic paths to scale an energy efficiency business¹⁰²:

1. Vertical Deepening: Strengthening presence and increasing market share within an existing market niche.

Mini-cases:

- EcoLight HCM initially installed LED systems in five schools across Ho Chi Minh City. After success, they secured contracts with three municipal sports centers, deepening their footprint in the educational & public infrastructure segment.
- ThermoTune VN, originally offering HVAC audits to hotels, added quarterly maintenance plans for the same clients, boosting recurring revenues by 35%.

2. Geographical Rollout: Expanding into new cities, regions, or countries using a proven business model.

Mini-cases:

- GreenInsulate Hanoi launched in Hanoi with affordable wall insulation. After validating their process, they opened in Da Nang six months later with the same supplier network—seeing a 120% increase in monthly jobs.

102 Adapted from OECD (2016). *Scaling Up: From Vision to Large-Scale Change*. Organisation for Economic Co-operation and Development.

- SolarHub Malaysia began in Selangor offering solar vendor-financing and expanded into Penang after securing local municipal partnerships, doubling their client base.

3. Product-Line Extension: Diversifying the startup's offering with new solutions that serve existing or adjacent customer segments.

Mini-cases:

- SmartMeter SG provided electricity usage dashboards to homeowners, then added water consumption monitor plugs for the same users—achieving a 25% upsell rate within two months.
- EnergyInsights VN started with industrial-level energy audits and later offered rooftop solar feasibility assessments to the same clients, increasing average client lifetime value by 40%.

Each of these scaling paths presents distinct advantages and trade-offs—from risk profiles and speed of execution to resource demands and market implications. In some cases, start-ups may pursue one path exclusively; in others, a hybrid or phased approach may be more appropriate. By understanding the differences between these pathways, energy efficiency start-ups can make more informed decisions and prioritize efforts that maximize impact, sustainability, and market fit as they grow.

Before selecting a scaling strategy, it is important to understand the distinct characteristics and implications of each path. Table 53 summarises three widely used scaling approaches for energy efficiency start-ups, framing their primary focus, growth mechanisms, risks, and resource needs to support strategic planning decisions.

Table 53: Comparison of Strategic Scaling Paths for EE Start-ups

Criteria	Vertical Deepening	Geographical Rollout	Product-Line Extension
Primary Focus	Increase market share within the existing core market and current product/service offering.	Expand existing solutions into new cities, provinces, or international markets.	Develop new products/services for existing or new customer segments.
Leverages	Brand trust, loyal customers, product-market fit in one market segment.	Proven solution and operations adapted for new regions.	R&D capabilities, existing relationships, adjacent customer needs.

Criteria	Vertical Deepening	Geographical Rollout	Product-Line Extension
Key Activities	Strengthen sales, boost adoption, upsell improvements, capture competitor share.	Conduct local market research, adapt product or service, build new operations, manage compliance.	Design new offerings, pilot test, expand supply chain, train teams.
Growth Mechanism	Deepen penetration of a known market.	Replicate and adapt successful models in new areas.	Diversify offerings and revenue streams.
Resource Intensity	Moderate to High (sales, customer service upgrades, minor R&D).	High (market entry, staffing, localization, regulatory compliance).	High (R&D, new supply chains, education of both teams and customers).
Risk Profile	Low to Moderate: Execution and saturation risk.	Moderate to High: New market, cultural, and operational risks.	Moderate to High: New product risks, customer confusion, operational complexity.
Speed to Market	Moderate Moderate	Moderate to Slow (based on logistics and localization).	Slow to Moderate (due to development timelines).
Best Fit For	Start-ups with a proven solution and loyal niche market. Example: EE retrofit provider scaling in industrial parks.	Solutions with broad relevance and digital delivery models. Example: cloud-based energy monitoring platforms.	Start-ups with strong R&D and brand equity. Example: EE lighting firm moving into full smart building tech.

Criteria	Vertical Deepening	Geographical Rollout	Product-Line Extension
Key Success Factors	Sales execution, market segmentation, tailored customer support.	Deep local insights, scalable ops, remote team management, partnerships.	Clear customer need, agile product development, smart go-to-market strategy.
Common Pitfalls	The market may be too small or become saturated.	High initial costs, fragmented teams, slow adoption in new regions.	Brand dilution, internal distraction, poor product-market fit.

Tips for Start-ups Choosing a Path

- **Validate before you scale:** Use vertical deepening first to strengthen your foundation and collect testimonials before attempting broader expansion.
- **Consider capital efficiency:** SaaS or digital EE solutions (e.g., energy dashboards) scale more easily than hardware-based products.
- **Stay focused:** Avoid stretching your team too thin across products or markets unless clear synergies exist.
- **Adapt your playbook:** Each scaling path may require changes to sales processes, marketing strategies, and operations models.

Example Applications

- A smart thermostat start-up begins with vertical deepening by dominating one urban market, then rolls out nationally after refining installation logistics.
- A startup providing industrial EE audits chooses product-line extension by introducing a cloud-based M&V (Monitoring & Verification) dashboard.
- A Viet Nam-based solar software firm validates its product locally before expanding into Southeast Asia via partnerships.

9.3 Functional Scaling Playbooks

Successfully scaling an EE start-up requires more than market demand—it demands structured, strategic execution across key business functions. This section provides actionable playbooks covering four critical domains: Operations, Sales & Channels, Capital & Cash Flow, and Team & Culture. Each playbook highlights WHAT to scale, WHEN to scale, HOW to do it, common risks, and locally tailored tips for Viet Nameese EE start-ups

Operations Ramp-Up

WHAT to Scale	WHEN to Scale
Increase the capacity and efficiency of manufacturing (for hardware) and/or deployment (for hardware or services) to meet rising demand while maintaining quality and cost-effectiveness.	Triggers: Reaching capacity limits, turning down orders, or seeing a strong sales pipeline. Timing: After achieving product-market fit and validating reliability and demand. Scaling too early risks wasting resources.
HOW to Scale	RISKS to Watch
1. Infrastructure & Tech Systems Use scalable platforms and modern tools (e.g., KiCad, Altium for PCB design) - Adopt cloud services (AWS, Azure) and automation (e.g., for invoicing, CRM) - Introduce CRM/ERP systems cautiously—only when workflows are mature. 2. Manufacturing (Hardware Startups) - Use multi-source component aggregators. - Start with labor-only EMS contracts to retain control. - Set quality checkpoints, document processes, and optimize lines.	- Quality drift: Decline in output quality due to rushed scaling or poor oversight - Supply chain disruptions: Overdependence on one supplier, price hikes, or delays. - Cost overruns: Unexpected scaling costs or poorly negotiated supplier terms - Process bottlenecks: Hidden constraints in assembly, QA, or logistics - Inventory mismanagement: Overstocking drains cash; understocking causes delays - Tech system overload: Premature ERP or misaligned tech

HOW to Scale	RISKS to Watch
3. Deployment (Service/Installation Startups) - Standardize kits, check-lists, and technician training. - Use field management software to streamline logistics. - Train and certify third-party installers to expand reach. 4. Supply Chain & Inventory - Diversify suppliers for critical parts - Maintain buffer stock, but avoid tying up cash in excess inventory - Build long-term, reliable supplier relationships with performance monitoring	

Local Tip: Before launching a full-scale operations expansion, test your revised manufacturing lines or deployment protocols in a controlled local environment. For example, use a specific industrial park or a network of early-adopter clients as pilot sites to refine processes, gather real-world feedback, and train staff. This localized pilot minimizes costly errors and builds confidence before broader rollouts.

Sales & Channel Scaling

WHAT to Scale	WHEN to Scale
Expand the start-up's sales capacity and go-to-market channels to drive consistent revenue growth. This includes growing the direct sales team, refining sales strategy, and building or expanding indirect sales channels (e.g., partners, resellers, alliances).	Trigger points: - Clear product-market fit established - Early traction from founder-led sales - Growing demand that exceeds current sales capacity Best timing: - After a repeatable and teachable sales process has been proven - When operations are ready to fulfill increased orders without bottlenecks

HOW to Scale	RISKS to Watch
1. Define Sales Strategy - Build a focused Ideal Customer Profile and understand their pain points, energy needs, and buying process - Choose the right sales model - Align sales motion with solution complexity (e.g., enterprise for B2B EE) 2. Build the Sales Team - Start with a strong individual contributor, not a VP - Hire talent with domain knowledge - Provide robust onboarding (product, process, CRM tools) - Foster a high-performance, learning-driven culture 3. Develop Sales Channels - Partner with ESCOs, HVAC installers, etc. - Create formal partner programs with training, incentives, and support 4. Enable Sales with Tools & Content - Implement CRM to track leads and manage pipeline - Develop sales collateral (ROI tools, case studies, whitepapers) - Automate repetitive sales tasks 5. Enterprise Sales Focus - Identify internal champions within large clients - Run pilot programs to build credibility - Ensure solutions are configurable and scalable for enterprise use	- Hiring misalignment: Sales hires without sector knowledge or cultural fit can slow growth - Process inconsistency: Lack of a standardized, teachable sales process - Channel conflict: Confusion or tension between internal sales and external partners - Unsustainable CAC: Poor targeting or inefficient sales execution driving up acquisition costs - Long sales cycles: Especially in public sector or large corporates, leading to cash flow delays - Overreliance on big clients: Revenue vulnerability if a few key deals fall through

Local Tip: When scaling sales in Viet Nam, leverage case studies and testimonials from successful pilot projects, especially those involving trusted government, enterprise, or NGO partners. These real-world references carry high local credibility. In parallel, engage actively in national and provincial EE associations to access relevant networks, customer segments, and policy support programs. Local champions can accelerate trust and deal conversion.

Capital & Cash Flow

WHAT to Scale	WHEN to Scale
Ensure that the start-up has sufficient capital and robust cash flow management to support growth. This includes forecasting cash needs, managing expenses and receivables, maintaining reserves, and securing the right mix of funding sources.	Ongoing process from early stages, but becomes critical during: – Major investments (new market, new factory, team expansion) – Fundraising rounds – Significant increase in fixed or operational costs
HOW to Scale	RISKS to Watch
1. Cash Flow Forecasting ▶ Track all inflows (sales, equity, loans) and outflows ▶ Use updated sales/expense data for accurate forecasts ▶ Build multiple scenarios (optimistic, realistic, pessimistic) ▶ For hardware: account for long lead times, inventory, and tooling 2. Working Capital Management ▶ Receivables: Prompt invoicing and follow-ups ▶ Payables: Negotiate terms, keep supplier trust ▶ Inventory: Balance just-in-time with supply chain resilience	▶ High Burn Rate: Scaling outpaces revenue, draining reserves ▶ Inaccurate Forecasting: Leads to misallocated resources ▶ Delayed Payments: Clients slow to pay, especially in public or enterprise sectors ▶ Unexpected Costs: E.g., equipment failures, regulatory fees, or price inflation ▶ Funding Gaps: Difficulties raising follow-on rounds due to missed milestones or market shifts ▶ Bad Financing Terms: Desperate funding can lead to high dilution or costly debt

HOW to Scale	RISKS to Watch
3. Expense Management ▶ Create detailed budgets per team or project ▶ Monitor actual vs. planned spending ▶ Control unnecessary overhead without compromising growth 4. Revenue Management ▶ Understand difference between bookings vs. cash received ▶ Analyze pricing model impact on cash flow ▶ Diversify client base to reduce exposure 5. Cash Reserves: Maintain 3–6 months' runway to absorb shocks. 6. Funding Strategy ▶ Use blended capital stack: equity for risk, debt for scale, grants for R&D ▶ Consider venture debt for VC-backed start-ups ▶ Apply for local and international cleantech grants ▶ Use crowdfunding to validate market and engage community	

Local Tip: Many EE solutions are project-based, with large upfront costs and delayed returns. Master project-level cash flow planning—accounting for milestone-based payments, installation timelines, and procurement delays. Partner with ESCOs or green finance facilities that can front installation costs and get repaid via shared savings or government incentives. This eases working capital pressure while keeping your growth on track.

Team & Culture Growth

WHAT to Scale	WHEN to Scale
Intentionally grow your team size, capabilities, and organizational culture to support scaling objectives—while safeguarding startup agility, innovation, and shared values. This includes building strong hiring pipelines, structured onboarding, internal communication systems, and leadership development processes.	▶ Continuously during growth ▶ Especially during rapid hiring phases ▶ When formalizing internal structures or processes ▶ As founders delegate and new leadership layers are introduced
HOW to Scale	RISKS to Watch
1. Define & Embed Culture Early ▶ Clearly state your mission, vision, and values ▶ Integrate values into hiring, onboarding, and performance evaluations ▶ Leadership must lead by example 2. Strategic Hiring ▶ Maintain high talent density—quality over quantity ▶ Transition from generalists to specialists without killing collaboration ▶ Prioritize cultural fit, diversity, and long-term potential 3. Robust Onboarding & Integration ▶ Design onboarding to instill company purpose and prepare new hires ▶ Use peer mentorship or buddy systems to ease integration 4. Communication & Transparency ▶ Use structured channels (e.g., town halls, newsletters, Slack, internal wiki)	▶ Culture Dilution: Core values may erode during fast hiring or reorganization ▶ Communication Breakdowns: Poor knowledge flow causes confusion and silos ▶ Talent Churn: Loss of alignment leads to disengagement and turnover ▶ Loss of Innovation: Excessive process or fear of mistakes stifles creativity ▶ Division & Resentment: “Old vs. new team” tensions, or cross-departmental friction ▶ Hiring Missteps: Weak onboarding or poor cultural fit weakens team cohesion ▶ Leadership Gaps: Lack of internal leadership growth creates bottlenecks

HOW to Scale	RISKS to Watch
▶ Encourage feedback loops to understand employee sentiment ▶ Share updates on performance and strategic shifts honestly 5. Leadership & Role Evolution ▶ Prepare founders to step back from execution and lead vision, culture, and strategy ▶ Invest in middle management and emerging leaders 6. Performance & Growth Pathways ▶ Set clear KPIs and provide regular feedback ▶ Offer upskilling, promotions, and growth trajectories ▶ Address poor performance promptly and constructively 7. Gradual Process Implementation ▶ Start with simple systems—“something is better than nothing” ▶ Avoid over-bureaucratization that slows agility 8. Embrace & Explain Change ▶ Build a culture that views change as a feature, not a threat ▶ Help staff understand the rationale behind decisions	

Local Tip: Culture is a strategic asset in the energy efficiency space. Many team members are driven by environmental purposes. Celebrate impact milestones—not just financial ones. For example: “X MWh saved,” “Y tCO₂e avoided,” or “Z schools retrofitted.” These reinforce purpose, build pride, and motivate the team to keep growing with meaning. During periods of change, re-anchor your team in your climate mission—it can be your greatest source of unity.

9.4 Risk Mitigation

Scaling a start-up—especially in the energy efficiency (EE) sector—introduces a complex web of risks across operations, finance, technology, people, and market dynamics. Without a structured risk management approach, these challenges can derail momentum and jeopardize long-term impact. This section provides a practical framework for identifying and addressing major scale-related risks that EE start-ups in Viet Nam may encounter.

Start-ups must recognize that many scale-up risks are interconnected: an operational bottleneck may increase customer churn, which in turn affects revenue and funding. Furthermore, reputation risks such as greenwashing—overstating environmental benefits—are especially dangerous in the EE sector. Transparency, credible data, and verified impact reporting are essential to avoid backlash from customers, investors, and regulators.

Adopting a learning culture and openness to external guidance can also mitigate “Not-Invented-Here” syndrome, which often prevents start-ups from benefiting from proven methods.

The matrix below summarizes key risk categories, specific threats, and corresponding mitigation measures:

Table 54: Risk-Mitigation Matrix for Scaling EE Start-ups

Risk Category	Specific Scale Risk	Proactive Mitigation Actions	Key Risk Metrics
Operational	Quality inconsistent delivery; drift; service	- Implement QMS and SOPs for manufacturing and installation - Standardize training and conduct regular quality audits - Integrate feedback loops and supplier quality controls	Customer satisfaction (NPS, CSAT), defect rate, warranty claims, installation success rate

Risk Category	Specific Scale Risk	Proactive Mitigation Actions	Key Risk Metrics
Financial	Cash burn; inadequate runway	- Forecast cash flow with scenario planning - Maintain lean budgeting and cost controls - Secure diverse funding (equity, grants, venture debt)	Cash runway (months), burn rate, variance vs. budget, DSO, DIO
Supply Chain	Component delays; supply shocks	- Diversify suppliers - Maintain buffer stock for critical items - Monitor lead times and logistics constraints	Supplier lead times, on-time delivery %, stockouts, inventory turnover
Market/Policy	Regulatory changes or incentive withdrawal	- Monitor policy trends and participate in advocacy - Build subsidy-independent models - Stay agile for market pivots	Changes in subsidy use, policy announcements, competitor moves
Human Capital	Talent churn; hiring gaps	- Develop strong culture and clear career paths - Provide training and onboarding - Offer competitive packages	Turnover rate, time-to-fill, engagement scores, Glassdoor reviews

Risk Category	Specific Scale Risk	Proactive Mitigation Actions	Key Risk Metrics
Technology	Obsolescence; emerging competition	-Invest in R&D - Monitor market/tech trends - Prioritize modular design and IP protection	R&D spending, new feature releases, patent filings, competitor benchmarking

Tip: To strengthen resilience, energy efficiency start-ups should develop project-level cash flow visibility, especially for contract-based or installation-heavy offerings. In addition, maintain transparent and third-party verified reporting of actual energy savings to build credibility. Engage early with provincial authorities and local communities to anticipate policy changes and strengthen adoption. Finally, anchor your internal culture around a shared sustainability mission to improve retention and reinforce your brand promise as you scale.

9.5 KPI Dashboard

As energy efficiency (EE) start-ups scale, maintaining visibility over business health becomes critical. A well-structured KPI (Key Performance Indicator) dashboard helps founders and teams track performance, course-correct early, and stay aligned with strategic goals.

A strong dashboard balances

- Lagging indicators (e.g., revenue, energy savings) to show historical performance.
- Leading indicators (e.g., pipeline growth, project implementation rate) to forecast future trends.

Crucially, in the EE space, performance must be proven—not just promised. That means tracking measurable energy and emissions savings, alongside traditional business metrics. The dashboard should also include both financial viability and mission impact to satisfy both investors and mission-driven partners.

Key Design Principles:

- Focus on actionable metrics.
- Visualize trends through charts and graphs.
- Update data frequently (ideally real-time).
- Benchmark KPIs against internal goals and, where possible, industry norms

Core Scaling KPIs for Energy Efficiency Start-ups

Table 55: Core Scaling KPIs for Energy Efficiency Start-ups

KPI	What It Measures	Why It Matters	Sample Benchmark
1. Unit Gross Margin	Profitability per unit: $(\text{Revenue} - \text{COGS}) / \text{Revenue}$	Scaling magnifies margin effects. Low margin = bigger losses at scale.	> 40–60% depending on model
2. CAC (Customer Acquisition Cost)	Total sales & marketing cost $\div$ New customers acquired	High CAC without strong LTV is unsustainable.	CAC payback < 12 months, LTV:CAC > 3:1
3. LTV (Customer Lifetime Value)	Average profit per customer over lifetime	Gauges long-term customer profitability. Crucial for ROI on acquisition.	LTV: CAC > 3:1
4. MRR/ARR (if SaaS or service model)	Predictable monthly/annual revenue	Indicates financial stability and valuation potential.	15–20% MoM MRR growth (pre-Series A)
5. NPS / CSAT	Customer satisfaction and referral likelihood	High service quality = low churn, higher referrals.	NPS > 50 (good), CSAT > 85%
6. Energy Saved & CO2 Avoided	Cumulative verified kWh/MWh saved and tCO2e avoided	Demonstrates impact, builds trust, unlocks funding.	Set yearly targets based on portfolio size

KPI	What It Measures	Why It Matters	Sample Benchmark
7.Implementation Rate & Time-to-Value	% of sold projects completed; Time until verifiable savings realized	Measures delivery success and alignment with sales promises.	> 75–80% implementation rate
8. Cash Runway	Cash balance ÷ monthly burn rate	Prevents funding crunch during growth phases.	Prevents funding gaps. Target: ≥ 12–18 months runway

Local Tip: To build trust with customers, investors, and regulators, prioritize third-party verification of energy savings and impact data. Tools like utility-integrated energy monitoring platforms, certified MRV (Measurement, Reporting, and Verification) methods, or smart meters can enhance credibility. Tailor KPIs to align with Viet Nam’s energy transition priorities and integrate them into impact reporting to access green funding or government support.

Case Study 1: Successful Scaling – Opower (Energy Efficiency SaaS)

Opower is a renowned success story in the energy efficiency sector. Founded in 2007, Opower provided cloud-based software to utilities, helping their customers save energy through personalized home energy reports and behavioral nudges. Opower grew rapidly over the next few years and nailed its core KPIs, enabling it to scale to a major enterprise and achieve a lucrative exit.

- **High Unit Margin:** As a software provider, Opower enjoyed high gross margins (~60–65%). Its SaaS model meant that once the software platform was built, adding new utility customers had relatively low incremental cost. In fact, Opower’s gross margin increased from ~54% in 2011 to about 65% by 2013 as it gained scaled¹⁰³. Such healthy margins (>60%) meant that each unit of growth was adding real gross profit, not just revenue. Scaling up did not erode profitability per unit, which positioned Opower to invest in further growth without collapsing under COGS

- **Efficient CAC & Strong LTV:** Opower's go-to-market was B2B2C – selling to large electric and gas utilities who would then roll out Opower's program to millions of their residential customers. This strategy resulted in higher upfront sales effort (enterprise sales can be costly), but it paid off in very high LTV contracts. Utilities typically signed multi-year agreements and renewals were common (Opower had contracts lasting 3+ years with major utilities). Each utility client could be worth many millions in revenue over time, far exceeding the cost to acquire that client. This dynamic likely gave Opower an LTV:CAC well above 3:1, meeting the benchmark for scalable economics. Additionally, because Opower's software delivered proven results, utilities often expanded programs or purchased additional services, further increasing LTV. The CAC payback period was reasonable for an enterprise software business – while exact figures aren't public, Opower's rapid revenue growth (see below) suggests it was landing big accounts that recouped sales investment quickly (often through initial program fees within the first year or so). In short, Opower's growth was efficient – they weren't burning cash to buy revenue at a loss; each customer acquired was a net positive investment.
- **Rapid Recurring Revenue Growth:** Opower hit a strong growth trajectory, a sign of product-market fit. Between 2011 and 2013, Opower's annual revenue tripled from about \$28.7 million to \$88.7 million¹⁰⁴. Prior to its IPO, Opower had 93 utility partners reaching 32.1 million end-users – evidence of both market penetration and recurring usage at scale. This translated into impressive ARR growth (since utilities paid ongoing fees). For example, Opower's monthly recurring revenues grew consistently as it added more utilities and expanded existing accounts, reportedly achieving ~50% CAGR in the early 2010s. Such momentum (far above the 15–20% MoM in the early stage benchmark) excited investors and gave Opower the resources to continue scaling. The growth was sustainable too, supported by strong underlying metrics rather than gimmicks.
- **Customer Satisfaction & Stickiness:** Opower's end customers (utility consumers receiving home energy reports) showed high engagement, which in turn made the utility clients happy. In one utility program, 81% of customers actively read the Opower reports, and customers receiving reports scored their utility higher in satisfaction surveys¹⁰⁵. This indicates Opower's product improved the utilities' own NPS scores and customer experience. For Opower, this meant content clients and a solid reputation – utilities were likely to renew and even refer other utilities. Opower's focus on delivering measurable value to end-users created a positive feedback loop: it bolstered the utilities' trust (critical in B2B), leading to low churn in its client base. High NPS/CSAT on both the end-user side and the utility

104 <https://www.utilitydive.com/news/what-made-opower-so-successful/247044/#:~:text=This%20approach%20is%20working,1%20filing>

105 renewableenergyworld.com

client side were a foundation for its long-term contracts. In summary, Opower's service quality and outcomes kept customers loyal, aligning with the NPS >50, CSAT >85% ideal (indeed, many utilities credit Opower for improved customer satisfaction).

- **Massive Impact (Energy Savings):** As an energy efficiency startup, Opower's mission was to save energy at scale – and it delivered. By 2018 (a decade in), Opower's programs had cumulatively saved 17 terawatt-hours (TWh) of energy for consumers, equivalent to \$2 billion off customer bills. This translates to millions of tons of CO2 avoided over the years. Hitting these impact metrics was not just feel-good – it became a selling point. The tangible proof of energy savings helped Opower convince more utilities (and regulators) to adopt its solutions, thus driving more business. It also attracted investors and acquirers who saw that Opower was truly fulfilling its purpose. In short, strong impact KPIs (KPI #6) reinforced the business case and trust in Opower, creating a virtuous cycle between mission and growth.
- **Fast Implementation & ROI:** Opower's solution was relatively quick to implement – often a utility could integrate and start sending Home Energy Reports in a matter of months. Once deployed, customers started saving energy immediately, with behavior changes and feedback loops leading to measurable reductions in usage. This speedy time-to-value meant utilities saw results within program years, aligning with regulators' annual efficiency targets. Meanwhile, Opower could scale deployments across millions of households using automated data analytics, ensuring a high implementation rate of its contracted projects. Essentially, if a utility signed up for (say) 500,000 homes to receive reports, Opower would deliver to all 500,000 – a 100% implementation of the “sold” volume. There was little drop-off. This operational scalability (high implementation rate) and quick results gave Opower a solid reputation for delivering on its promises at scale.
- **Managed Burn and Sufficient Runway:** While growing, Opower was mindful of its finances. It raised around \$65 million in VC funding prior to its IPO, which it used to fuel development and expansion, and then raised \$116 million in the IPO itself. This war chest ensured that Opower had a comfortable runway during its high-growth years. They did run losses in some years (net loss of \$14.2M in 2013, as the company invested heavily in growth), but those losses were planned and covered by capital – not a sign of distress. Importantly, Opower avoided any cash crunch during scaling; it timed its fundraising well (including going public) to maintain 12+ months of runway at all times. By 2014–2016, the company had enough stability that it became an attractive acquisition target. In 2016, Oracle acquired Opower for \$532 million in cash¹⁰⁶ validating the startup's value. This outcome shows that

Opower navigated the growth stage without running out of money, unlike many startups that scale recklessly. Its prudent cash management and strong metrics gave investors confidence to continue funding its journey until a successful exit.

In summary, Opower's story highlights a well-executed growth strategy: high margins through a scalable business model, efficient customer acquisition with strong lifetime value, happy customers and real impact fueling low churn and easier sales, and careful financial planning to support the scale. Opower hit or exceeded the core KPI benchmarks (e.g. gross margins in the 60%+ range, LTV:CAC likely >3, strong recurring growth, NPS benefits, significant energy impact, etc.), which meant when they poured resources into scaling, it resulted in a robust, valuable business. The company's success can be directly tied to having those fundamentals in place before and during their scale-up phase.

Case Study 2: Failed Scaling – Next Step Living (Home Energy Solutions)

On the flip side, Next Step Living serves as a cautionary tale of a start-up that scaled rapidly without a solid foundation, ultimately collapsing. Founded in 2008 and based in Boston, Next Step Living (NSL) offered home energy assessments and retrofits (insulation, windows, solar installations, etc.) to homeowners, often through the utility-sponsored Mass Save program. The company grew extremely fast – at one point it had over 800 employees and was generating \$100+ million in annual revenue¹⁰⁷ – but by early 2016 it abruptly shut down after running out of cash. NSL's failure is widely attributed to premature scaling with poor unit economics and operational weaknesses, as we break down below:

- **Flawed Unit Economics (Low/Negative Margins):** Next Step Living chased top-line growth aggressively, expanding into multiple service lines – not just home energy audits, but also solar installations, insulation, windows, and HVAC upgrades. Many of these offerings were inherently lower-margin businesses (for example, selling and installing solar panels is capital-intensive and price-competitive). NSL ended up with very thin margins – or even losing money – on many sales. Essentially, to spur revenue growth, they priced services attractively and grew volume, but at the cost of profitability. News reports later noted that in several categories, NSL was “losing money on each sale,” which is the kiss of death when scaling. This is exactly what KPI #1 (unit gross margin) warns against: NSL's gross margins were well below the recommended >40% range – in some cases possibly near zero or negative after accounting for labor, materials, and customer acquisition deals. As a result, the more NSL scaled, the more cash it burned. The company's leadership “moved into industries that have low margins and require a lot of cash, like solar”, which ultimately stretched the business too thin. This strategy meant NSL's impressive revenue growth was not sustainable profit growth. When a start-up's core unit economics are upside-down, scaling up just multiplies the losses – a fate that NSL could not escape.

- **High CAC, Poor LTV:** NSL's model involved heavy sales & marketing to drive homeowner sign-ups for energy improvements. They employed an "ambitious sales team" and spent a lot to acquire customers (community outreach, partnerships, advertising under the Mass Save program, etc.). However, the lifetime value (LTV) of each customer was limited – a homeowner might get an initial energy audit (often subsidized or free), and then perhaps one retrofit project. After that, there was not much repeat business, since once a home is insulated or solarized, the customer's need is met. This one-and-done dynamic means NSL's LTV per customer was relatively low (maybe a few thousand dollars of gross profit at best, spread over the projects). Yet the CAC to get each homeowner through the door was high, especially as NSL expanded into new regions. The result was likely an LTV:CAC ratio far below 3:1 – a sign of trouble. In fact, NSL began losing money to acquire customers, counting on volume and incentives to somehow make it up. They did not achieve a <12 month CAC payback; in some cases they might never have fully recovered the acquisition cost. This imbalance between CAC and LTV meant NSL's growth was fundamentally unprofitable. It's a classic case of "growth at all costs" backfiring because the costs outweighed the returns. When VC funding eventually slowed, the house of cards collapsed since the unit economics couldn't support the business without constant cash infusions.
- **Uncontrolled Growth vs. Operational Capacity:** Next Step Living tried to do "too much, too soon". They scaled to serve multiple states and added various product lines rapidly, which introduced complexity that outpaced their operational infrastructure. By early 2016, they had tens of thousands of customers served over 8 years, but cracks were showing in project delivery. Many customers experienced long delays or subpar service. When NSL shut down, it left 700 homeowners waiting for scheduled energy assessments and another 1,300 partway through insulation/weatherization jobs that suddenly halted mid-project. This low implementation rate – failing to complete a significant chunk of sold projects – indicates NSL had overextended its execution abilities. Their processes and subcontractor network couldn't keep up with the volume of sales. Time-to-value suffered as well: some customers never saw the promised energy savings because their projects weren't finished. This not only deferred revenue for NSL (since they couldn't recognize revenue on uncompleted jobs), but also created a bad customer experience. It's a direct consequence of ignoring KPI #7 (implementation rate & time-to-value) – NSL sold more than it could deliver reliably, a mistake that scaling exacerbated.
- **Customer Satisfaction Collapse:** Hand in hand with the above, NSL's customer satisfaction plummeted. While the company initially had a positive mission and did succeed with many customers, the rapid expansion led to quality control issues and oversights. By 2015–2016, dozens of complaints had been filed with the Massachusetts Attorney General's Office about NSL's work. Homeowners

reported “horror stories” of botched installations or poor follow-through. Online reviews turned sharply negative. In fact, utility partners became aware of the customer service problems and had to increase inspections and demand improvements from NSL’s management. All of this indicates a low NPS/CSAT – certainly nowhere near the >50 NPS or 85%+ satisfaction one would hope for. Dissatisfied customers also hurt referral business and may have made utilities less eager to keep partnering with NSL. When a startup scales up without maintaining service quality, it breeds detractors faster than promoters. In NSL’s case, the growing pool of unhappy customers eroded the company’s reputation just as it was trying to scale, contributing to its downfall.

- **Impact vs. Business Viability:** Next Step Living did achieve some environmental impact – they performed thousands of energy audits and upgrades, which undoubtedly saved energy for many households. In press releases, the company often touted the cumulative kWh saved or carbon reduced (important for marketing and securing partnerships). However, because of the issues above, that impact was not enough to “unlock” further support when finances turned sour. Investors and stakeholders lost confidence due to financial losses and execution problems, despite the mission. This shows that while impact metrics (KPI #6) are important, they cannot compensate for a broken business model. In NSL’s case, even though they were in the energy efficiency business (a sector that can attract grants or incentives for impact), their inability to turn those savings into profit meant they couldn’t sustain operations. Essentially, impact alone couldn’t save NSL because other KPIs were misaligned. This is a lesson for mission-driven startups: you must balance impact with solid economics to scale successfully.
- **Running Out of Cash (Short Runway):** Ultimately, the most acute cause of NSL’s failure was that it ran out of cash – a direct result of the above factors. The company had raised around \$80 million in venture capital over its life and was spending heavily to support its expansion (800 staff, multi-state operations, etc.). But by early 2016, facing mounting losses and unable to secure more capital, NSL hit the end of its runway. Investors pulled away support as they saw “the writing on the wall” – essentially, they realized the business model was not going to turn profitable. With no cash, NSL had to abruptly shut its doors in March 2016, laying off its remaining ~210 employees and leaving customers in limbo. The collapse was sudden but not entirely surprising, given that the company never established a sustainable burn rate. NSL’s cash runway should have been a red flag much earlier – if leadership had projected the burn vs revenue, they might have recognized they would run out of money without drastic changes. Conventional wisdom of maintaining 12–18 months of runway was ignored; NSL was essentially operating on thin ice, hoping growth alone would attract ever-more funding. This strategy failed. The premature scaling drained their cash faster than they could raise or earn more, illustrating

why runway (KPI #8) is crucial. Running out of cash is the final symptom of all the underlying KPI issues coming to a head.

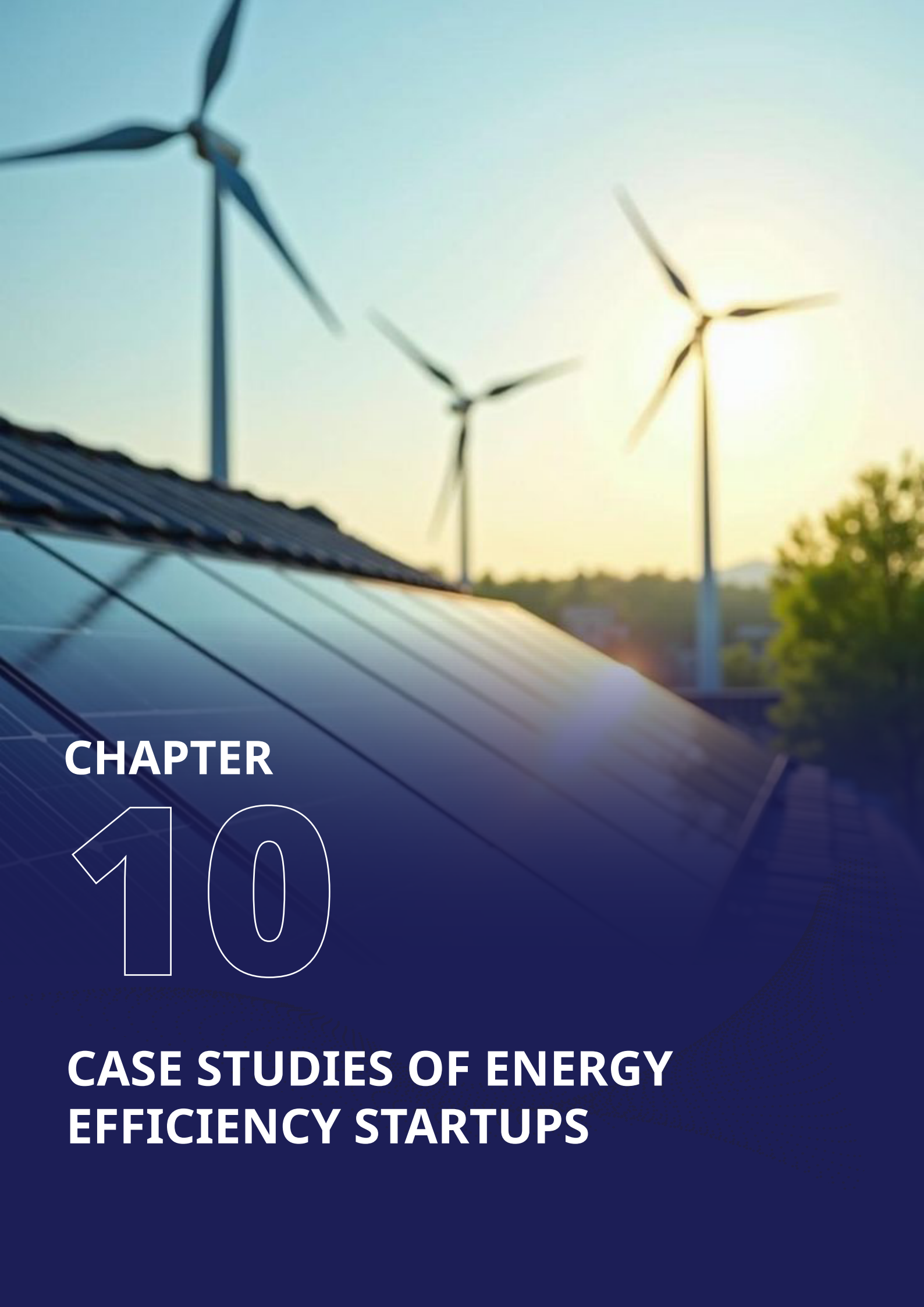
In retrospect, Next Step Living's trajectory shows how not to scale. It expanded wildly without ensuring fundamental metrics were healthy. Low unit margins (from costly services), unsustainable customer acquisition economics, operational overreach, and slipping customer satisfaction all snowballed. At scale, those issues became fatal – the company burned through cash and goodwill rapidly. As one analysis put it, NSL's demise was due to “growing pains as a result of rapid expansion and moving into industries that have low margins and require a lot of cash”. In other words, it was a textbook case of premature scaling. The contrast with Opower is stark: whereas Opower focused on a scalable high-margin model and grew within its means, Next Step Living tried to brute-force growth in multiple directions without a stable foundation, resulting in a boom-and-bust.

9.6 Additional Resources and Templates

Practical templates have been compiled and made available for adaptation to business and investment needs:

- **Template #1 – Startup Hiring Plan Template:** A workforce plan is provided to be designed in alignment with startup growth and project needs.
- **Template #2 – Series A Data Room Checklist:** A structured checklist is offered to guide the preparation of key documents and information for fundraising.
- **Template #3 – MoU Template:** A customizable Memorandum of Understanding format is included for collaborations and partnerships to be formalized.

The full set of templates and additional resources can be downloaded by scanning the QR code below.



CHAPTER

10

**CASE STUDIES OF ENERGY
EFFICIENCY STARTUPS**



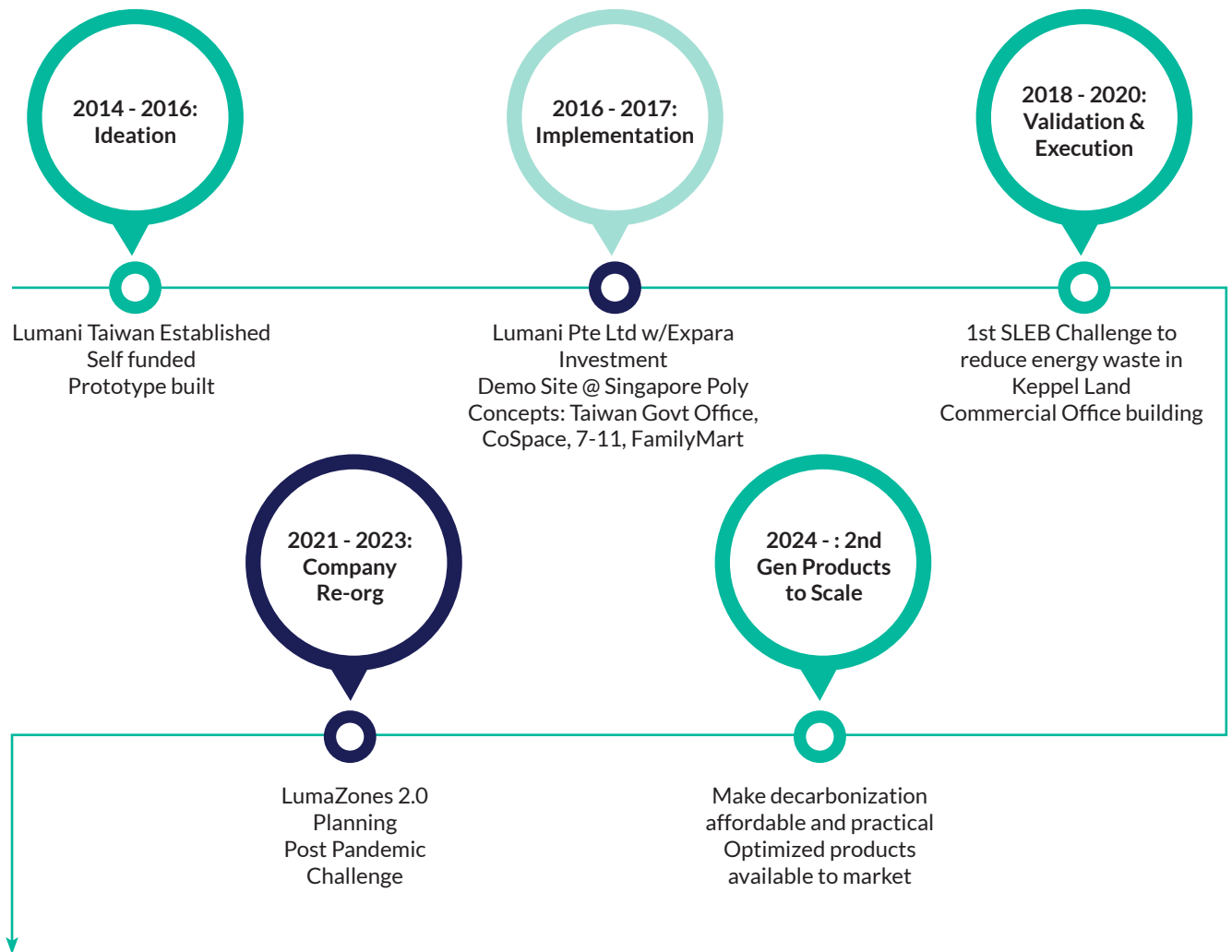
CHAPTER 10. CASE STUDIES OF ENERGY EFFICIENCY STARTUPS

10.1 Case Study 01: Lumani's LMZ2 Turning Lights Into a 40% Energy Saving Machine

Startup Profile

Lumani Pte Ltd¹⁰⁸ is a Singapore-based startup pioneering autonomous ambient management systems for buildings. Its flagship product, LumaZones 2.0 (LMZ2), combines smart lighting with HVAC optimization in a single, wireless, edge-computing platform. Unlike typical “smart lighting” products, LMZ2 detects true human presence (even when occupants are still), runs entirely offline, and can be retrofitted without rewiring — drastically lowering costs and complexity.

Founded in 2014 and backed by Expara Venture Capital, Lumani has deployed LMZ2 in high-profile sites such as Keppel Bay Tower (Singapore's first net-zero energy commercial building) and corporate offices of GSK. By enabling 30–40% energy savings while integrating with carbon credit programs, Lumani is directly supporting Asia's decarbonization and green building goals.



Lumani addresses critical and persistent challenges in building energy management:

- **Limitations of Conventional Smart Lighting:** Most existing solutions require internet connectivity, only detect movement (not still occupants), and lack integration with air conditioning. This causes user frustration (lights switching off mid-task), poor energy optimization, and high maintenance complexity.
- **Manual Scheduling Inefficiencies:** Facility managers often have to manually adjust lighting and HVAC schedules daily. This is time-consuming, error-prone, and wastes energy in low-occupancy periods.
- **High Retrofit Costs & Downtime:** Traditional building management systems (BMS) require rewiring, downtime, and large upfront investment — making adoption slow, especially in older buildings.

Edge-computing and retrofit-ready platform: LumaZones 2.0's core advantage lies in the autonomous management platform with five standout differentiators

- **Edge-First Autonomy:** Runs fully offline, ensuring reliability in all conditions.
- **Still-Occupant Detection:** 24 GHz radar senses presence even without movement.
- **Four-Step Adaptive Modes (LASM):** Adjusts lighting and HVAC through fine-grained modes, not just on/off.
- **True Retrofit Capability:** Installs without rewiring, lowering costs and speeding deployment.
- **Scalable Service Model:** Buildings can start offline, then add cloud-based analytics, remote management, and BMS integration as needed.

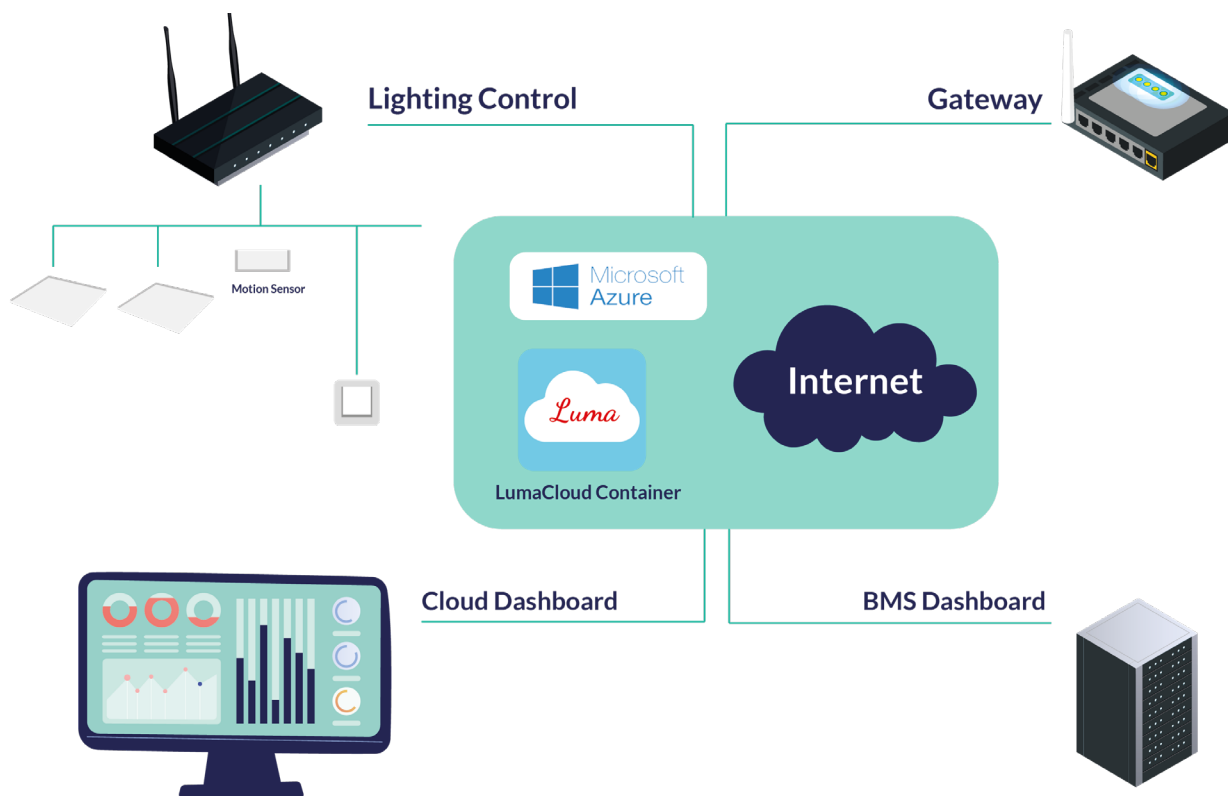


Figure 16: LumaZones 1.0 Autonomous Ambient Management Platform Motion Sensor Collects Activity Data (Patented)

Business model and value proposition: Lumani’s business model blends upfront hardware sales with flexible, service-based revenue streams, delivering quick payback for customers and sustained growth for the company.

- **Hardware Sales:** Sensors, wireless-enabled lights, gateways, and retrofit kits that integrate seamlessly into existing systems.
- **Optional Subscriptions:** Cloud analytics, centralized building management, ESG reporting, and carbon tracking—available as upgrades when customers are ready.
- **Carbon Credit Monetization:** Converts verified energy savings into tradable carbon credits, adding a new revenue source for clients.

For building owners and operators, LMZ2 delivers immediate 30–40% reductions in lighting and HVAC costs, higher green certification scores, and lower maintenance needs. For sustainability-focused developers, it offers a scalable, upgradeable system built for alignment with global decarbonization targets.

Impact & Results

Since its launch, LumaZones 2.0 has proven its value in some of the region’s most demanding environments. Deployments in high-profile sites such as Keppel Bay Tower, FamilyMart, and GSK’s Singapore facilities have consistently delivered up to 40% reductions in combined lighting and air-conditioning energy use. For facility managers, the system has removed the need for daily manual scheduling, freeing up time for higher-value tasks and improving operational consistency.

Its retrofit-friendly design has opened doors across diverse markets—from commercial offices and hospitals to hotels, retail, and light industrial facilities. Beyond cost savings, LMZ2 enables participation in carbon credit schemes, effectively turning efficiency gains into a new revenue stream for clients while advancing their green certification goals.

Lessons Learned

Lumani’s journey shows that success in energy efficiency isn’t about chasing the latest “smart” trend, but about solving real operational problems in ways that work under everyday conditions. By designing LMZ2 for true autonomy—able to detect occupants even when still, operate without internet connectivity, and integrate lighting with HVAC—Lumani addressed gaps that conventional systems leave open.

Their commitment to retrofit-friendly design lowered adoption barriers, allowing older buildings to modernize without costly rewiring. Early flagship deployments in prominent green-certified projects built trust and visibility, while a layered revenue model—hardware first, optional services later—created long-term customer relationships. Together, these choices demonstrate how thoughtful engineering, market fit, and strategic partnerships can turn a technical solution into a scalable, climate-positive business.

Key Takeaway

Insights from Lumani	
Problem -Solution Fit	Solve clear, high-cost inefficiencies like manual scheduling and unoptimized HVAC.
Business Model Innovation	Layered approach: hardware upfront, optional SaaS and carbon credits later.
Retrofit Advantage	Design to install without rewiring for rapid adoption.
Technology Integration	Use radar sensing, edge computing, and multi-step control for precision.
Climate Impact	Quantify energy savings and link them to carbon monetization.
Strategic Partnerships	Work with developers, sustainability challenges, and government-linked programs to scale.

Learning Objectives: Show how startups succeed by solving real operational inefficiencies, designing for retrofit adoption, and linking climate benefits to financial value.

Discussion Questions:

1. Why did retrofit capability matter more than new features for Lumani's adoption?
2. How does the "hardware-first, SaaS-later" model balance growth and risk?
3. In what ways can carbon credits become a sales tool for efficiency startups?

10.2 Case Study 02: Abivin

Startup Profile

Abivin¹⁰⁹ is a Hanoi-based startup pioneering AI-driven logistics optimization in Southeast Asia. Its flagship product, Abivin vRoute, is an all-in-one fleet and route optimization platform built on advanced algorithms, machine learning, and real-time data integration. Unlike conventional transport management systems (TMS), vRoute goes beyond static routing and GPS tracking to deliver dynamic scheduling, 3D loading visualization, and end-to-end supply chain visibility.

Founded in 2015 by Nam Long Pham, a University of Cambridge alumnus and former Google engineer, Abivin has grown from a small R&D team into a regional logistics innovator. With recognition as the 2019 Startup World Cup Champion (winning \$1M) and deployments across Vietnam, Myanmar, Singapore, and Indonesia, the company is reshaping logistics operations for both enterprises and third-party logistics providers.

Abivin addresses several critical inefficiencies in last-mile delivery and fleet management:

- Manual Routing & Low Productivity

Most delivery routes are still arranged by hand, leading to long planning times, wasted driver hours, and underutilized capacity.

- Fuel Fraud & Rising Costs

Unmonitored fleets face fraud in fuel claims and unnecessary expenses in a sector where Vietnam spends over \$5B annually on motorcycle fuel

- Fragmented IT Adoption

ERP, EDI, and TMS penetration in Vietnam's logistics sector remain under 20%. This lack of digitization prevents companies from optimizing fleet operations and tracking performance in real time.

Abivin vRoute is more than a fleet management system—it's a dynamic optimization engine with five standout differentiators:

- **Advanced AI Optimization:** Proprietary algorithms that reduce planning time by up to 80% while boosting delivery capacity by 30%.
- **Mobile-Enabled Operations:** Apps for drivers and supervisors enable real-time task tracking, photo proof-of-delivery, and geo-fencing.
- **3D Loading Visualization:** Ensures efficient packing and reduces wasted trips.
- **Real-Time Analytics & BI Dashboards:** Full visibility into fleet KPIs, route performance, and operational costs.

- **Regional Fit:** Tailored for ASEAN markets, where motorbikes and fragmented delivery networks dominate.

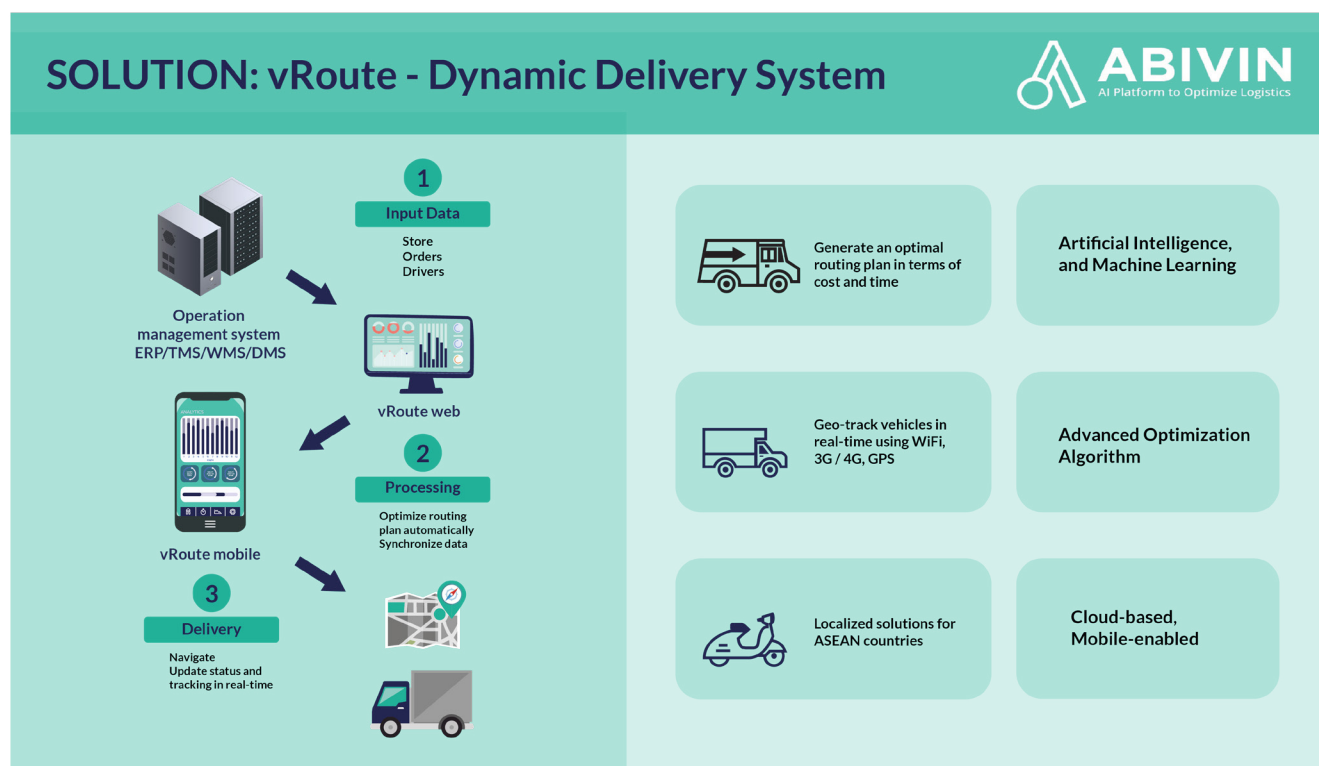


Figure 17: Abivin Startup's technology solutions

Abivin runs a SaaS-driven model with service flexibility.

- **License + Subscription Fees:** Per-user monthly pricing for ongoing software access.
- **Implementation & Customization:** One-time setup and integration fees to tailor solutions to clients' supply chains.
- **Value Delivered:** Up to 40% cost savings in fuel and labor, a 250% ROI over three years, and higher fleet utilization.

For logistics companies, vRoute enables tighter operational control, reduced costs, and greater transparency. For multinational clients, it offers digital integration across complex supply chains in emerging markets.

Impact & Results

Abivin vRoute has scaled rapidly across the region, processing over 300,000 delivery orders and 75,000 container shipments monthly—equivalent to around 1% of Vietnam's freight volume. Case studies show clients reducing delivery manpower by over 30%, cutting daily distance traveled, and extending working capacity without increasing fleet size.

The company's global recognition—including the ASEAN Entrepreneur Award 2020 and the Startup World Cup Grand Prize—has positioned it as one of Southeast Asia's most credible logistics technology providers. Its presence in Vietnam, Myanmar, Singapore, and Indonesia reflects both the scalability of its SaaS model and its adaptability to diverse logistics networks.

Lessons Learned

Abivin's journey shows that digital transformation in logistics requires both deep technology and practical deployment models. By focusing on algorithms that directly cut costs, and tailoring features for motorbike-heavy, fragmented supply chains, the company avoided the pitfalls of generic Western TMS platforms.

Participation in global competitions built early credibility, while a flexible SaaS + service pricing model lowered adoption barriers. By solving real inefficiencies like fuel fraud and manual scheduling, Abivin created clear ROI for clients, ensuring rapid customer buy-in. Its story highlights how an emerging market startup can leapfrog traditional solutions by focusing on local realities with global technology standards.

Key Takeaway

Key Area	Insights from Abivin
Problem-Solution Fit	Targeted pain points: manual routing, fuel fraud, and low IT adoption
Business Model	Hybrid SaaS: subscription-based with one-time implementation fees
Technology Advantage	AI-driven route optimization, 3D loading visualization, real-time fleet analytics
Regional Adaptation	Designed for ASEAN conditions—motorbikes, narrow roads, fragmented logistics
Impact	30–40% cost savings, 250% ROI, 1% of Vietnam's freight volume digitized
Partnerships & Scale	Leveraged global competitions, regional clients, and awards to expand credibility

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Energy Efficiency Business and Financing Models

1. Common Energy Efficiency Business Models

Criteria	ESCO (Energy Service Company)	PAYS (Pay As You Save)	EaaS (Energy as a Service)
Business Model	ESCO designs, finances, implements, and maintains energy efficiency projects. Repayment is linked to energy savings achieved.	Customers repay the investment through a portion of the energy cost savings, with repayments remaining lower than the expected savings.	Customers pay for energy services (e.g., lighting, cooling, compressed air) rather than purchasing equipment.
Asset Ownership	Typically owned by ESCO during the contract term and transferred to the customer upon contract completion.	Usually owned by the utility, financing provider, or equipment supplier until fully repaid.	Retained by the service provider throughout the contract term.
Payment Structure	Payments are made from verified energy savings under Shared Savings or Guaranteed Savings contracts.	Repayments are collected through utility bills (on-bill financing) and linked to the utility meter rather than the customer.	Fixed or variable service fees based on usage (e.g., per lumen, ton of cooling, or m ³ of compressed air).
Risk Allocation	The ESCO assumes performance risk related to energy savings, while the customer may bear credit risk.	The utility or financing provider assumes most repayment risk.	The service provider assumes equipment, performance, operation, and maintenance risks.
Typical Contract Term	Medium to long term (5–20 years).	Typically shorter than ESCO contracts and aligned with the asset payback period.	Medium to long term (5–15 years).

Criteria	ESCO (Energy Service Company)	PAYS (Pay As You Save)	EaaS (Energy as a Service)
Suitable Customers	Large commercial buildings, industrial facilities, and public-sector entities undertaking major retrofits.	Households and SMEs seeking energy-efficient equipment without upfront capital investment.	Organizations seeking to convert CAPEX into OPEX and focus on core business activities.
Accounting Treatment	May be recorded as an asset and liability, depending on the contract structure.	Often treated as an operating expense through utility bills.	Typically treated as an OPEX and may be off-balance-sheet.

2. Types of energy service contracts

ESCOs can adopt different contractual arrangements to deliver energy-efficiency projects. The three most common contract types are described below.

Contract Type	Investment Provider	ESCO Compensation
Guaranteed Savings –ESCO guarantees a specified level of energy savings and compensates the client if the target is not achieved.	Client or financing institution	Service fee and performance-based compensation
Shared Savings – Energy cost savings achieved by the project are shared between the ESCO and the client according to a pre-agreed ratio.	ESCO	Agreed share of energy cost savings
Chauffage –ESCO is responsible for operating and maintaining the energy system and delivering the agreed energy service.	ESCO	Energy service fee

EMERGING ENERGY EFFICIENCY TECHNOLOGIES

Cross-cutting Energy Efficiency Innovation Trends and Business Opportunities

Innovation Trend	Key Solutions and Business Opportunities	Example Startups
Digitalization and Smart Energy Management	IoT sensors and smart meters, cloud-based Energy Management Systems (EnMS), and web/mobile dashboards that enable real-time monitoring, energy optimization, anomaly detection, and performance reporting.	Dexma (Spain) – Provides a cloud-based energy management platform that combines IoT sensors and artificial intelligence to optimize energy performance.
Artificial Intelligence (AI) and Predictive Analytics	AI-enabled optimization of HVAC, lighting, and industrial systems; predictive maintenance; and automated energy management to reduce energy consumption and operational costs.	BrainBox AI (Canada) – Uses deep learning and real-time data to optimize HVAC systems in commercial buildings.
Renewable Energy Integration	Demand-response systems, battery energy storage, and microgrid optimization solutions that improve renewable energy utilization, energy resilience, and peak-load management.	Cleanwatts (Portugal) – Develops energy communities that integrate solar generation, energy storage, and energy management through a digital platform.
Green Materials and High-Efficiency Equipment	Advanced insulation materials, high-efficiency motors and appliances, and passive cooling technologies that reduce energy consumption and improve system performance.	Aeroseal (United States) – Provides duct sealing technology that reduces energy losses in HVAC systems.

Innovation Trend	Key Solutions and Business Opportunities	Example Startups
Innovative Business and Financing Models	Energy-as-a-Service (EaaS), ESCO contracts, green bonds, and blended finance mechanisms that help overcome upfront investment barriers and improve project bankability.	Redaptive (United States) – Provides Energy-as-a-Service solutions and end-to-end financing for energy efficiency upgrades.

Typical EE Technologies in Industry and Startup Solutions

Category	Relevant Technologies	Example
Energy Management and Loss Prevention	AI-powered energy analytics IoT sensors and automation Cloud-based predictive maintenance Industrial automation and robotics Energy Management Systems (EMS)	IoTeamVN (provides AIoT-based EMS solutions, enabling real-time monitoring, automated reporting, and energy performance analysis)
Waste Heat Recovery	Organic Rankine Cycle (ORC) systems IoT and AI-enabled optimization of WHR systems Digital Twins Micro combined heat and power (micro-CHP) systems	ESEC has implemented waste heat recovery solutions that capture and reuse thermal energy from industrial processes.
Energy System Retrofits	Smart LED lighting systems High-efficiency motors and variable frequency drives (VFDs) High-efficiency HVAC and heat recovery systems Solar PV with energy storage Smart grids and demand response systems	BenKon Energy Efficiency Solutions applies AI and IoT technologies to optimize HVAC systems and energy consumption

Typical EE Technologies in Buildings and Startup Solutions

Category	Relevant Technologies	Example
Smart Building Technologies	Building Energy Management Systems (BEMS) Automated Demand Response (ADR) Integrated IoT platforms Web and mobile dashboards Smart grid integration	Lumani offers a cloud-based BMS/BEMS platform that optimizes building operations and reduces electricity consumption.
Sustainable Building Materials	Advanced insulation materials High-performance lightweight concrete Phase Change Materials (PCM) High-performance glazing and façades Building-integrated energy-generating materials and reflective coatings	Straw Wood develops carbon-negative insulation panels from agricultural straw, providing a sustainable alternative to conventional insulation materials.
Energy Retrofits for Existing Buildings	Smart HVAC upgrades LED lighting and automation High-performance windows and doors	BenKon provides intelligent HVAC control solutions for existing buildings, improving energy performance.
AI-Based Simulation and Design Optimization	Building Information Modelling (BIM) Digital Twins AI-powered energy simulation tools Virtual and Augmented Reality (VR/AR) Passive design optimization	EDEEC specializes in energy simulation and green building consulting, helping optimize HVAC systems, lighting, and building envelopes.

Category	Relevant Technologies	Example
Renewable Energy Integration	Building-integrated solar solutions (BIPV) Energy storage systems Building microgrids	Xsolar provides rooftop solar solutions with smart monitoring and battery storage integration for buildings.

Typical EE Technologies in Buildings and Startup Solutions

Category	Relevant Technologies	Example
Electric Vehicles (EVs) and Charging Infrastructure	Affordable EVs for urban and rural mobility Battery technologies and charging/swapping networks Renewable energy-powered charging and Vehicle-to-Grid (V2G) solutions	Selex Motors develops electric motorcycles, battery-swapping stations, and integrated fleet solutions for logistics and delivery services.
Smart Mobility, Logistics, and Fleet Management	AI- and IoT-enabled route optimization and vehicle tracking Ride-hailing and shared mobility platforms Fleet management and predictive maintenance systems Digital mapping and real-time traffic analytics	Abivin offers an AI-powered SaaS platform for transport optimization, helping logistics operators reduce fuel consumption and operating costs.
Smart Transport Infrastructure	AI-controlled traffic signals Smart parking systems Vehicle-to-Infrastructure (V2I) communication Dynamic routing and traffic management applications	VietChao deploys smart parking solutions using IoT sensors and automated management systems.

Category	Relevant Technologies	Example
Personal Mobility and Urban Transport	Electric bicycles and motorcycles Cycling and pedestrian infrastructure Micromobility solutions for last-mile transport	Dat Bike (Viet Nam) develops high-performance electric motorcycles for urban mobility.
Green Logistics and Freight Transport	AI-based route optimization software Electric and hybrid freight vehicles Energy-efficient logistics hubs and cold-chain solutions	VoxCool develops AI- and IoT-enabled thermal energy storage solutions for cold-chain logistics, reducing reliance on diesel-powered cooling systems.