



## POLICY RECOMMENDATIONS FOR ELECTRIFICATION OF INDUSTRIAL HEAT IN VIET NAM

**This Policy brief presents why and how Vietnam can accelerate industrial electrification in light manufacturing sectors to support national climate commitments while maintaining export competitiveness. It draws on a technical study commissioned by WWF, H&M Group and IKEA.**

### Introduction

Viet Nam is one of the fastest-growing economies in the world, with an average GDP growth rate of approximately 6.6% per year since 2000 (*World Bank, 2024*). However, the country is also consistently ranked among those most vulnerable to climate change. Without strong action in this decade, rising temperatures are expected to intensify extreme weather events, undermine food security, and reduce Viet Nam's GDP by an estimated 12–14.5% annually by 2050 (*World Bank, 2022*). The development pathways chosen today will shape emissions trajectories for decades to come, and decarbonization will be critical to ensuring long-term prosperity, enhancing resilience, and strengthening Viet Nam's international competitiveness.

Viet Nam has announced ambitious climate commitments, including its pledge at COP26 to achieve net-zero emissions by 2050. The country's Nationally Determined Contribution (NDC) targets an unconditional reduction of 15.8% in emissions, which could increase to up to 43.5% with international support by 2030. Achieving these commitments will require substantial emission reduction efforts across the industrial sector.

# INDUSTRIAL HEAT DECARBONIZATION MATTERS FOR VIETNAM'S CLIMATE AND NET ZERO TARGETS BY 2050

Over the past two decades, Viet Nam has emerged as one of the world's leading manufacturing hubs, attracting a significant share of foreign direct investment (FDI) inflows. In 2024, the manufacturing and processing sector alone attracted nearly USD 25.58 billion in registered FDI, accounting for 66.9% of the country's total registered FDI (*MPI, 2025*).

Light industries such as textiles and garments, footwear, wood processing, and food processing play a significant role in Viet Nam's economy. In 2024, the country's total export value reached USD 405 billion (*MPI, 2025*), of which textiles and garments accounted for USD 43.57 billion (*MOIT, 2025*), footwear approximately USD 27 billion (*VCCI, 2025*), and wood and wood products around USD 16.25 billion (*Vietnam Customs, 2025*).

These industries also provide employment for approximately 5–6 million workers, equivalent to 10–12% of the national labor force. However, industrial production currently consumes around 47% of Viet Nam's total energy use (*MOIT, 2022*) and accounts for roughly one-third of total national emissions. Many manufacturing facilities still rely on coal-fired boilers, biomass, and fossil fuels to generate heat for production processes.

Moreover, major international brands in Europe and the United States that source from Vietnamese suppliers are increasingly imposing requirements on carbon emissions accounting and supply chain transparency. These requirements pose challenges to the global competitiveness of manufacturing facilities, while also underscoring the need for targeted policy support.

Wet processing stages in factories—including drying, dyeing, finishing, and washing—account for up to 75% of total emissions in the textile and garment sector. Total emissions could be reduced by 40–60% by 2030 through the deployment of electrification technologies such as heat pumps and electric boilers. In addition to reducing greenhouse gas emissions, replacing conventional boilers with electrified technologies can significantly improve on-site air quality, with reductions of up to 90–100% in PM2.5 and NOx emissions compared to traditional fossil fuel-based boilers, while also enhancing occupational safety by eliminating the need for fuel handling and transportation.

## **Key benefits of heat pumps and electric boilers for textile and other manufacturing**

- Reducing heat related emissions by 40–60% by 2030
- Improving local air quality through 90–100% reduction in PM2.5 and NOx emissions
- Reduces fuel transport risks
- Supports Delivery of the National Climate Change Strategy
- Aligns with Power Development Plan VIII (PDP8)
- Contributes to Just Energy Transition Partnership (JETP)

These benefits align closely with Vietnam's broader energy transition policies including in National Climate Change Strategy by 2050, Power Development Plan VIII (PDP8), Just Energy Transition Partnership (JETP) and the development of a national carbon market.

## KEY BARRIERS AND RELATED POLICY RECOMMENDATIONS FOR INDUSTRIAL ELECTRIFICATION

Several structural challenges continue to limit the deployment of electrification technologies across manufacturing sectors. To support Vietnam's climate commitments and address key barriers while maintaining industrial competitiveness, the following policy interventions are proposed as basis for further discussion:

### **BARRIER 1 Policy and Regulatory Uncertainty**

Key mechanisms supporting industrial decarbonization—such as the Direct Power Purchase Agreement (DPPA) mechanism and the national carbon market—are still in early implementation phases and need greater clarity.

#### **POLICY ACTION 1: Refine the Direct Power Purchase Agreements (DPPA)**

DPPA uptake is constrained by unclear guidance on transmission and distribution service fees, contract registration procedures, and technical requirements. Moreover, electrification and PPAs are closely linked, if industrial processes don't shift to electricity-heavy operations, the demand for renewable PPAs may be limited, reducing the market pull from manufacturers. Accelerate approval of Direct Power Purchase Agreements (DPPA) to allow manufacturers to procure renewable electricity more easily.

### **BARRIER 2: Infrastructure and Grid Constraints**

Industrial parks face limitations in grid capacity, renewable energy integration, and energy storage infrastructure.

#### **POLICY ACTION 2: Streamline Industrial Parks Permitting and Infrastructure Regulations**

Support grid capacity upgrades and renewable connection point in infrastructure priority lists. Incentivize behind-the-meter storage (e.g., via grants or tax incentives) to absorb variable renewables. Develop demand response / flexible-grid mechanisms to allow industrial loads (e.g., heat pumps) to contribute to grid balancing. Develop one-stop or fast track processes within industrial zones for permitting for renewable energy processes, grid infrastructure and transformer station upgrades.

### **BARRIER 3: High Upfront Capital Costs**

Electrification technologies often require higher initial investment than traditional boilers or heating systems. Many small and medium-sized factories lack the collateral or credit history required to access affordable financing.



@Toan Do Huy/WWF-Vietnam

### **POLICY ACTION 3: Expand Access to Concessional Finance**

Provide targeted grants or subsidies for early-stage feasibility studies of electrification projects. Establish concessional loan programs (potentially backed by JETP or development partners) for deployment of heat pumps, electric boilers, and storage. Establish “electrification innovation funds” or pilot grants to de-risk SME demonstrations and early adopters.

### **BARRIER 4: Energy Pricing Distortions**

Current energy pricing structures do not fully reflect the environmental costs of fossil fuels, weakening the financial case for electrification investments.

### **POLICY ACTION 4: Accelerate Implementation of Vietnam’s Carbon Market**

Ensure that industrial heat electrification projects can generate verified emissions by developing and mandating a standardized MRV system for emissions savings from industrial electrification (e.g., heat pumps) and integrate the MRV into Vietnam’s ETS and carbon market infrastructure. Promote alignment of MRV with international carbon markets (e.g., Article 6 of the Paris Agreement) to mobilize additional finance.

### **BARRIER 5: Limited Technical Awareness**

Many facilities remain unfamiliar with electrification technologies, implementation requirements, and available financing mechanisms.

### **POLICY ACTION 5: Support SMEs through Technical Assistance**

Increase technical assistance trainings and advisory services through VNEEP, MAE, MOIT, JETP, etc.. to help smaller manufacturers evaluate electrification technologies, conduct energy audits, find technology and certification providers and implement low-carbon production systems.

### **BARRIER 6. Electrification Benefits Not Recognised in Current MRV Systems**

### **POLICY ACTION 6: Develop a Standardized Measurement, Reporting, and Verification (MRV) System for Industrial Heat Electrification**

Develop standardized MRV system to quantify emission savings from industrial electrification, and integrating into Vietnam’s ETS and carbon market infrastructure. This MRV system requires significant methodological development and verification frameworks.



## CONCLUSION

Vietnam's manufacturing success has been built on strong integration into global supply chains. As climate policies reshape international trade, the ability to produce low-carbon industrial goods will become an increasingly important source of competitive advantage.

Electrification of industrial heat provides a practical pathway to reduce emissions while supporting economic growth. With targeted policy support, improved financing mechanisms, and coordinated action across industry and government, Vietnam can position itself as a leader in low-carbon manufacturing in Asia.

Early action will allow the country not only to meet its climate commitments but also to secure the long-term competitiveness of its export industries and continue rapid development.

## ANNEX

Barrier	Policy Direction	Specific Policy interventions	Outcomes
Policy and regulatory uncertainty	Embed heat decarbonization in national climate agenda (including NDC and JETP)	<p>Establish clear heat specific targets like a 20% renewable heat share in key sectors (textile, garment, wood, and food/beverage) by 2030.</p> <p>Include amendments to the Electricity Law to incentivize DPPAs and grid upgrades, updates to the next phase of VNEEP (2026–2030), and revisions to MoIT’s energy-efficiency regulations.</p> <p>Consider establishing a new legislative framework dedicated to industrial decarbonization, clarifying electricity-pricing rules for electrified heat, and providing statutory backing for industrial direct power purchase agreements.</p>	<p>Industrial heat electrification becomes an explicit and measurable component of Vietnam’s long-term decarbonization plan.</p> <p>Long term government support is assured and motivates action.</p>
Infrastructure and grid constraints	Deploy technology specific policies for industrial parks (IP) where electric boiler demand will concentrate.	<p>Publish electrification plans for Industrial Parks that streamline technology permitting, rooftop-solar zoning, and includes group fast-track approval processes.</p> <p>Prioritize IP infrastructure investment and incentivize behind-the-meter storage via grants or tax incentives to absorb variable renewables.</p> <p>Develop demand response / flexible-grid mechanisms to allow industrial loads (e.g., heat pumps) to contribute to grid balancing.</p>	<p>Reduces implementation congestion and curtailment risks.</p> <p>Enhances policy security and flexibility for electrified industrial processes.</p>

High upfront capital costs	Expand the available and concessional finance available to facilities	<p>Create a JETP sub-window for industrial heat and develop minimum energy-performance standards for thermal equipment such as boilers, dryers, and heating systems.</p> <p>Partner with international development agencies such as the World Bank, GIZ, and ADB for concessional pilot funds and technical advisory services.</p> <p>Provide guarantees for concessional loan programs that prioritize manufacturing clusters and carbon reductions that contribute towards the national carbon ETS accounting system.</p> <p>Ensure long-term regulatory clarity on tariffs (e.g., taxes on imported heat pumps) and DPPA implementation to build investor trust</p>	<p>Reduces upfront capital barriers, particularly for SMEs.</p> <p>Improves project bankability and mobilizes private investment.</p>
Energy pricing distortions	Incorporate heat decarbonization into emerging incentive markets to capture the value of carbon reductions.	<p>Implement Vietnam’s Carbon Market (pilot ETS under Decision 232/QĐTTg) on time with clarity.</p> <p>Enable industrial heat electrification to generate or pay using allowance savings or credits. Promote alignment with international carbon markets (e.g., Article 6 of the Paris Agreement) to mobilize additional finance.</p>	Creates financial incentives for decarbonization and corrects cheap carbon-intensive technologies.
Measurement , Reporting, and Verification (MRV) Standards	Develop a standard heat electrification MRV system	<p>Develop a standardized MRV system for industrial heat electrification and integrate into Vietnam’s ETS and carbon market infrastructure.</p> <p>Provide technical support from MAE or MOIT to measure, report, and verify emission reductions with trust within MRV.</p> <p>Establish a national digital reporting platform to support consistent, verifiable GHG data collection.</p> <p>Include mandatory CO2 reporting from industrial thermal processes in the ETS roadmap.</p>	<p>Quantifies emissions reductions with certainty and builds trust in emerging markets</p> <p>Permits the inclusion of heat electrification projects in broader carbon markets.</p>

<p>Limited technical awareness</p>	<p>Increase technical assistance trainings and advisory services through VNEEP, MAE, MOIT, JETP, etc..</p>	<p>Provide training and public resources for SMEs on technology and providers, energy audits, and certifications.</p> <p>Establish innovation funds or grants to support SME demonstrations.</p> <p>National programs for technical training and certification to develop the skilled workforce required to install, maintain, and optimize electrified heat systems.</p>	<p>Builds know-how in SMEs that reduces project failure.</p> <p>Strengthens local supply chain capacity.</p>
------------------------------------	--	---	--



## WWF Policy Brief

### For more information

Pham Thi Cam Nhung  
Climate and Energy Practice Lead,  
WWF-Viet Nam  
[nhung.phamcam@wwf.org.vn](mailto:nhung.phamcam@wwf.org.vn)

Maja Wennerberg Fåhraeus  
Business & Nature Expert, WWF  
Sweden  
[maja.wennerberg.fahraeus@wwf.se](mailto:maja.wennerberg.fahraeus@wwf.se)

@Toan Do Huy/WWF-Vietnam



Working to sustain the natural world for the benefit of people and wildlife.

together possible™

[vietnam.panda.org](http://vietnam.panda.org)

© 1986 Panda symbol WWF – World Wide Fund for Nature (Formerly World Wildlife Fund)  
® “WWF” is a WWF Registered Trademark. WWF, Avenue du Mont-Bland, 1196 Gland, Switzerland. Tel. +41 22 364 9111. Fax. +41 22 364 0332.

For contact details and further information, please visit [vietnam.panda.org](http://vietnam.panda.org)