Hungry for Energy, Eager for Development

Vietnam has continued to experience relatively high economic growth since the “Doi Moi” reforms in 1986. The energy sector has made great contributions to that achievement by securing sufficient primary energy and electricity to serve the national economy and facilitating the industrialization and modernization of the country.

Figure 1: Vietnam GDP Growth Rate


ENERGY CONSUMPTION

By 2017, Vietnam’s total primary energy consumption (TPEC) reached 59.7 million tons of oil equivalent (Mtoe), about 1.5 times higher than 2007. Industrial-sector consumption doubled after 10 years, at a rate of 7.4 percent per year.¹

According to Vietnam’s Ministry of Industry and Trade (MOIT), the TPEC will amount to about 134.5 Mtoe in 2035, equivalent to an average annual demand growth of 4.7 percent from 2016 to 2035. It is noteworthy that, among energy-intensive sectors, the industry is forecasted to grow at 5.0 percent per year for 2016 to 2035, the second-fastest growth rate for any sector, behind the transport sector (5.7 percent per year).²

Figure 2: Total Final Energy Consumption (TFEC) by Sector, 2007–2017

![Figure 2: Total Final Energy Consumption (TFEC) by Sector, 2007–2017](source)

ENERGY SUPPLY: VIETNAM’S ECONOMIC DEVELOPMENT RELIES ON CARBON INTENSIVE SOURCES OF ENERGY

Having been a net energy exporter since 1990 (mainly of coal and crude oil), Vietnam became a net energy importer in 2015. This rate continued to grow quickly, primarily driven by increased coal imports for power generation. In this context, energy supply is increasingly dependent on coal and imported fuels. From 2007 to 2017, the total primary energy supply (TPES) increased 50 percent from 45.4 Mtoe (1,900 PJ) in 2007 to 71.7 Mtoe (3,000 PJ) in 2017. Coal shifted from the third-largest fuel source in 2007 to the largest primary source today, while oil is the second largest.³

It is estimated that energy imports will account for 37.5 percent of the energy mix in 2025 and 58.5 percent in 2035. Therefore, the current and future energy security status of Vietnam is not guaranteed. Risks of supply-demand imbalance and higher dependence on imported energy sources result in vulnerability to external shocks such as energy market volatility or geopolitical instability in the region and the world.\(^4\)

**VIETNAM IS MORE ENERGY INTENSIVE THAN OTHER ASEAN COUNTRIES**

Energy intensity is a measure of the amount of energy used to produce a unit of output. If data are available, intensity can be calculated for any economic sector or production process. Improving energy intensity can help avoid huge amounts of energy use, generating financial savings for consumers and holding back growth in greenhouse gas (GHG) emissions.\(^5\)

Vietnam’s economy is more energy intensive than many other countries in the region (Figure 4) and across the world. According to the International Energy Agency (IEA), Vietnam is using energy relatively inefficiently, represented by the largest energy consumption to produce a unit of GDP (456.9 kilogram of oil equivalent (ktoe) per $1,000). In addition, Vietnam’s energy related CO\(_2\) emission intensity is among the highest in the world. Due to mobilizing a large amount of coal thermal power in Vietnam’s power mix, the CO2 emissions increase is likely to continue into the future.


Changes in primary energy intensity are influenced not only by improvements in energy efficiency (EE) but also by changes in economic structure, such as moving away from energy-intensive industry toward less intensive service sectors.  

**A Policy Framework Needed to Promote Energy Efficiency**

The Government of Vietnam was aware of the need to have a national EE program to (1) ensure economic competitiveness through reducing energy intensity and energy costs; (2) reduce the dependency on imported energy; and (3) invest in new energy sources, including power plants. Such a program should prioritize the following topics:

- Raise awareness on EE nationwide.
- Control the energy intensive consumers in key sectors: industries, building, and transport.
- Promote the use of high-efficiency equipment and appliances in the economy.
- Introduce and facilitate good practices on energy utilization and management.

In 2003, the government issued Decree No. 102/2003/ND-CP on efficient and effective use of energy to set out initial regulations on EE in Vietnam as required by the Electricity Law. The decree itself has contributed to a certain extent to the content of the Law on Efficient and Effective Use of Energy (“EE Law”), to be discussed later on, for instance with the categorization of the Designated Energy Using entities (DEUs) in industries, buildings, services, and transport away from other energy consumers and with the instructions on how to control the energy consumptions in these entities.

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6. Ibid.
Three years later, the government approved the Vietnam National Target Program on Energy Efficiency (VNEEP) for 2006 to 2015, with targets to “reduce 3-5% of the total energy consumptions nationwide during the period 2006 – 2010, and 5-8% of the total energy consumptions nationwide during the period 2011 – 2015, as compared to business-as-usual (BAU).” The Ministry of Industry (then Ministry of Industry and Trade) was assigned as the focal executive agency of VNEEP.

VNEEP is comprised of 6 tasks and 11 activities, among which the following key activities were highlighted:

- Developing the legal framework for EE, including the EE Law and the Building Code;
- Developing energy management (EMS) models for industries and buildings;
- Developing energy pricing policies and regulations to promote EE;
- Introducing 10 Minimum Energy Performance Standards (MEPS) for EE labelling; and
- Strengthening the EE network, with eight established EECs as the kernel of the network.

VNEEP was divided into two phases:

- Phase 1 (2006 to 2010) focused on developing legal framework and professional networks for EE, testing on different Best Available Technologies/Best EE Practices (BAT/BEP), and categorizing Designated Energy Using (DEU) entities.
- Phase 2 (2012 to 2015) focused on strengthening and enforcing prioritized EE measures, mandating Minimum Energy Performance Standards (MEPS) and EE labelling, and applying a mandatory Building Code to new or renovated buildings. Among those priorities, the EE improvement in key industries is highlighted with dedicated indicators as quoted below:

Specific energy consumptions (SEC) of key energy intensive industries should be improved during 2012-2015 as follows: (i) for steel production: from 179 kgoe/metric ton of product down to 160 kgoe/metric ton of product; (ii) for cement production: from 97 kgoe/metric ton of cement down to 87 kgoe/metric ton of cement; and (iii) for textile and apparel production: from 773 kgoe/metric ton of fiber down to kgoe/metric ton of fiber).

In conjunction with VNEEP, the government also issued Decision No. 80/2006/QD-TTg on April 14, 2006, on approving the Electricity Saving Program (ESP) during 2006 to 2010, which would focus on (1) raising public awareness on electricity savings; (2) setting a target of 10 percent electricity savings in public buildings/facilities; and (3) introducing Demand Side Management (DSM) and Demand Respond (DR) to industrial facilities. The ESP ran in parallel with VNEEP Phase 1 until the EE Law was in effect.

**Low-carbon Policy Feasibility Proven Through VNEEP Implementation**

**EE POLICY DEVELOPMENT**

In nine years of operation, VNEEP has built the foundation for EE in the long run by establishing a legal and policy framework.

The most important achievement from VNEEP Phase 1 is the issuance of the Law on Efficient and Effective Use of Energy (Law No. 50/2010/QH12), which was ratified by the National Assembly on

7. The VNEEP was established by Decision No. 79/2006/QD-TTg issued on April 14, 2006. BAU was referred to as the forecasted total energy consumption in Vietnam’s Power Development Plan VI (PDP-6).
June 17, 2010, and has been in effect since January 1, 2011. The law promulgates the enforcement measures applied to Designated Energy Using entities (DEUs), on mandatory Monitoring, Reporting and Evaluation (MRE) protocol, and the roles and responsibilities of relevant ministries and organizations in implementing the law.

The law is complemented by two important decrees:

- Decree 21/2011/ND-CP, issued on March 29, 2011, guiding the implementation of the EE Law; and
- Decree 134/2013/ND-CP, issued on October 17, 2013, stipulating the sanction against administrative violations in the field of electricity, safety of hydroelectric dams, and energy efficiency.

Under the EE Law, other legal documents were also developed, as illustrated in the figure below.

Figure 5: Timeline of Key Policies on EE

With regard to standards and labelling, VNEEP has proposed two legal documents to the Government for approval and issuance:

- Decision No. 51/2011/QĐ-TTg, dated September 12, 2011, from the prime minister enacted a list of energy labels for vehicles and devices that require energy labels.
- Decision No. 68/2011/QĐ-TTg, dated December 12, 2011, from the prime minister enacted a list of energy-saving vehicles, devices that are equipped, purchased for the organizations using the state budget.

**EE Best Practice in Industries**

The mandated application of energy management systems, which provide a structure to monitor energy consumption and identify opportunities to improve efficiency, is growing, driven by policy and financial incentives. Out of 77 industrial plants that announced an energy management plan (EMP), 15 companies have received certifications for ISO 50001—a global standard for energy management developed by the International Organization for Standardization in 2011—and 5 case studies have been presented in the EE information network. In total, 65 companies have completed assessment of steam systems, of which 62 invested in steam system improvement; and 85 companies completed assessment of air compression systems, of which 77 invested in system improvement.8

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A national network—consisting of 10 EE centers, over 20 industrial promotion centers under provincial Departments of Industry and Trade, and private energy service providers—has been established and strengthened to support industries in implementing EE solutions.

The joint efforts by all stakeholders have helped achieve positive results in some key industries: energy intensities in 2015 have been improved impressively as compared to 2010, with 10.9 percent improvement in the cement industry, 24.5 percent improvement in iron and steel, and 19 percent improvement in textile and leather (Figure 6).

**Figure 6: Energy Intensity Improvement in Key Industries during VNEEP Phase 2**

![Changes of energy intensity in key industries](image)


### Compulsory Standards and Labeling and Piloting Market-based Initiatives

The EE labelling program under VNEEP has been well deployed, with 8,000 types of products energy labeled by the of 2015 and 5 national laboratories certified for EE testing and labelling. The MOIT put significant effort into developing minimum energy performance standards (MEPS) and testing standards to support the labeling, in collaboration with Ministry of Science and Technology (MOST) and other relevant ministries.

The MOIT was also ambitious in piloting Energy Service Company (ESCO) models, with 6 ESCO companies established and registered. The MOIT has been working with the Ministry of Finance to develop a new Energy Performance Contract to avoid the risk of contract payment arbitration.

### Economic and Low-carbon Impacts

Energy savings through two phases of VNEEP have fulfilled the targets: in total 17.5 Mtoe has been reduced (253.5 TWh equivalent)—4.9 Mtoe has been achieved from 2006 to 2010 (3.4 percent reduction) and 12.61 Mtoe has been saved from 2012 to 2015 (5.8 percent reduction).

With a limited public budget mobilized for VNEEP (approximately $24 million, or VND 518 billion), the program helped reduce total GHG emissions from 2006 to 2015 by around 167 MtCO2-e. As such, the

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9. Public budget includes state budget (central and provincial) and ODA grant.
mitigation cost for public investment is estimated at $0.14 per tCO2-e, without taking into account the cost savings from electricity consumptions and from investing in new power plants.

With 5.8 percent (12.6 Mtoe) savings from the national energy consumption, contribution from the industrial sector is about 8.3 percent (6.6 Mtoe)—equivalent to the avoidable investment of 5,000 megawatts (MW) in coal-fired power plants.

Enhancing energy efficiency can also support a higher penetration of renewable energy (RE) and other decentralized technologies such as rooftop solar heating and power generation, smart grids and micro-grids, and waste-to-energy, thus reducing GHG emissions significantly. As emphasized by the Global 100% Renewable Energy campaign, “energy efficiency and energy conservation represent core components of a sustainable 100% RE strategy.”

**Key Drivers of Success**

**POLITICAL FEASIBILITY**

VNEEP was designed and executed in compliance with key strategic plans of the country:

- The standpoints, principles, goals, and objectives were consistent with the necessity of having a sustainable, low-carbon energy system. It also reflected the “Orientation for Vietnam’s national energy development strategy by 2020, with vision to 2050” in the 10th Politburo’s Resolution No. 18-NQ/TW, issued on October 25, 2007.
- The VNEEP is also compliant with the Electricity Law and the related National Power Development Plans VI and VII (PDP-6, PDP-7).
- Targets set by VNEEP are reflected in Vietnam Green Growth Strategy and Vietnam NDC.

**COMMITMENTS BY KEY STAKEHOLDERS**

According to Brian Motherway (head of the IEA’s EE Division), “IEA analysis shows a clear correlation between policies in energy efficiency and results. Where good policies are put in place, efficiency gains are made; without them, efficiency stalls. Therefore, government action is key – provided it is taken by the government as a whole . . . Only a determined, cross-government approach can deliver efficiency gains.”

VNEEP was named as a “National Target Program,” thus there were high-level commitments from the Government with regard to midterm state budgeting for VNEEP. However, at the working level, a good coordination and a strong commitment among line ministries and local authorities would be required to secure the expected results.

From the donor side, technical support and knowledge exchange are always important to building local capacity. During the second phase, the focus of major donors was diverted to the supply side (i.e., renewable energy), thus a number of EE activities could not be deployed as expected. However, the budget-support funding from Danida’s Low Carbon Transition in Energy Efficiency (LCEE) program

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12. Law No. 28/2004/QH11, ratified on December 03, 2004; Decision No. 110/2007/QĐ-TTg, issued on July 18, 2007; and Decision No. 1208/QD-TTg, issued on July 21, 2011.
has supplemented the shortfall in state budget and the delay in disbursement and helped VNEEP-2 complete some key policy indicators.

From local business side, commitments on building capacity for the long term and allocating budget for EE investment are very important to realizing EE projects. There were also strong commitments from the EE network to provide technical support and relevant services to the EE investment projects.

POLICIES AND INCENTIVES ARE AVAILABLE
Beside the categorization of DEUs for applying strict energy management, the government also offered different incentives (e.g., tax, direct/indirect subsidies, credit guarantee) to EE investment projects. For instance, tax incentives for EE projects have been highlighted in Decree No. 108/2006/ND-CP on the implementation of Law on Investment and detailed in Law No. 32/2013/QH13 on Amending the Law on Corporate Income Tax.

Barriers and Challenges to Long-term Success
The following barriers and challenges during VNEEP have been identified and reflected:

WEAK COORDINATION BETWEEN LINE MINISTRIES AND PROVINCIAL AGENCIES
Implementing EE policies requires good coordination between ministries and between the central government and local government. Observations during VNEEP Phase 2 show that such coordination is still not as good as it should be; delays in response, insufficient resource allocation, and reluctance in applying compliance enforcement are common problems in the implementation of the EE Law.

ACCESS TO FUNDING FOR EE INVESTMENT
During the second phase, the budget was allocated from the climate change and green growth account jointly managed by the Ministry of Planning and Investment (MPI) and the Ministry of Natural Resources and Environment (MONRE), thus the disbursements were somewhat delayed due to the approval process, leading to successive delays at working levels. A two-year intermittence between the two phases due to a delay in securing medium-term budgeting has also led to a slowing down of EE activities nationwide, as relevant agencies had no resources available to carry out designated tasks and activities.

In addition, starting from 2010, Vietnam was recategorized as a lower middle-income country and thus could not access concessional loans, instead having to consider non-concessional loans close to a commercial rate. Therefore, lending and credit-based programs could no longer offer preferable interest rates to EE investment projects.

Energy Price Structure Does Not Encourage Long-term Investment (Mainly Due to Process Technology)
The policy of regulating electricity tariffs through bracket pricing to keep the consumer price index (CPI) low and attract foreign-direct investments (FDI) on industries has made the average tariff per constant 2002 prices decrease from 2003 to 2013. It influenced the way decisions on process improvement are made, as the industries tend to take either low-hanging fruit measures (at no cost or very low cost) or an investment option with five-year return on investment (ROI) at most.
Figure 7: Average Electricity Tariff (VND/kWh) in Constant 2002 Prices Decreased Gradually, 2003-2013


Data Processing and Management

Data access and reliability are still a major concern, due to lack of a transparent legal system (e.g., regulations, protocols, and guidance) and a dedicated energy data center for sector analysis and policy development. Figure 8 illustrates the unreliability of energy and economic data when assessing the impact of EE policies during the transition between two phases of VNEEP, with an increase of (primary) energy intensity from 2006 to 2010, peaking at the end of VNEEP Phase 1. This trend did not reflect the EE improvements in economic sectors nor the impact of policies and initiatives during the first phase, and thus more information and data is needed to analyze or explain.

Observations also show that there were human resource shortages as well as limited capacity of those in charge at both the ministry and province levels to synthetize and analyze data from energy audit and management reports.

Figure 8: Reliability of Data a Key Concern for Evaluating VNEEP

A Stronger Commitment on EE through VNEEP Phase 3 (2019–2030)

In 2019, the Vietnamese government approved a new National Program on EE for the period 2019 to 2030 (Phase 3, or VNEEP-3) to show its commitment to the Paris Agreement on climate change. VNEEP-3 sets a reasonable target of reducing “5-7% of the total energy consumptions nationwide during the period 2019 – 2025, and 8-10% of the total energy consumptions nationwide during the period 2019 – 2030, as compared to BAU,” as compared to the Green Growth target of 20 to 30 percent GHG emission reduction in 2030 for the energy sector as a whole.14

Priorities should be given to:

▪ Deploy the application of compulsory EE standards/regulations (e.g., MEPS) together with sanctions on EE measures for energy intensive sectors, industries, and products; and
▪ Eliminate all barriers to ensure transparent, market-based energy prices; eliminate electricity tariff cross-subsidy among consumer groups, regions, and zones; and strengthen mechanisms, policies, and market-driven tools to promote energy efficiency.

VNEEP-3 was designed to complement the shortfalls and overcome barriers identified in the VNEEP.

Political and Legal Foundation

VNEEP Phase 3 will realize the energy sector’s GHG emissions reduction targets of 8 to 25 percent by 2030 as committed to in Vietnam’s Nationally Determined Contributions (NDC) through the execution of the National Action Plan to implement the Paris Agreement and secure the electricity saving target highlighted in the Revised Power Development Plan VII (RPDP-7).15

The program design does reflect the “Orientation for Vietnam’s national energy development strategy by 2020, with vision to 2050” in the 10th Politburo’s Resolution No. 18-NQ/TW, issued on October 25, 2007. However, with the recent issuance of the “Orientation for Vietnam’s national energy development strategy by 2030, with vision to 2045,” VNEEP-3 shall be reviewed and updated to reflect the key targets and activities as follows16:

▪ Energy efficiency and environmental protection must be considered as an important national policy and a responsibility of the whole society;
▪ Total final energy consumption should reach 105 to 115 million TOE by 2030 and 160 to 190 million TOE by 2045, respectively;
▪ Ratio of energy savings to the total final energy consumption, as compared to the BAU scenario, should be around 7 percent in 2030 and 14 percent in 2045 (minimum target);
▪ Energy consuming sectors should be restructured, especially FDI-related subsectors, to minimize energy intensity, and policies should be adopted to encourage the development of industries with low energy consumption and high socio-economic efficiency;
▪ Compulsory EE standards/regulations (e.g., MEPS) should be deployed together with sanctions on EE measures for energy intensive sectors, industries, and products;
▪ Incentive policies should be adopted to promote the use of clean and renewable energy, especially

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15. Decision No. 2053/QD-TTg, issued on October 28, 2016.
in industry and transport, and the development of electric vehicles should be promoted in line with the world's common trend;

- All barriers should be eliminated to ensure transparent, market-based energy prices; any cross-subsidy electricity tariff among consumer groups, regions, and zones should be eliminated; mechanisms, policies, and market-driven tools to promote energy efficiency should be strengthened.

**Expectations from VNEEP Phase 3**

**EE IMPLEMENTATION IN KEY INDUSTRIES SHOULD BE ENFORCED**

VNEEP-3 declares specific EE targets for key industries:

(i) during 2019-2025: 3-10% for iron and steel industry, minimum 7% for chemical industry; 18-22.5% for plastic industry, minimum 7.5% for cement industry, minimum 5% for textile and leather, 3-6.9% for beverage industry, 8-15.8% for pulp and paper industry; and

(ii) during 2025-2030: 5-16.5% for iron and steel industry, minimum 10% for chemical industry; 21.5-24.8% for plastic industry, minimum 10.9% for cement industry, minimum 6.8% for textile and leather, 4.6-8.4% for beverage industry, 9.9-18.5% for pulp and paper industry.

VNEEP-3 also set the target of 100 percent of DEU entities to apply an energy management system as required by the EE Law.

**STRONGER INVOLVEMENT OF THE PRIVATE SECTOR IN EE INITIATIVES**

The involvement of the private sector in VNEEP-3 is very important, given the awareness required and the strong commitment on investing in process improvement. The two cases below illustrate how private-led initiatives can drive the EE efforts in the sector.

- The Cement Sustainability Initiative (CSI) was started in 1999 under the auspices of the World Business Council for Sustainable Development (WBCSD), with the active participation from leading global cement companies. Over its 10-year existence, the CSI has conducted independent research on how the cement industry could meet its sustainability challenges and then worked closely with cement companies to develop guidelines and business cases for the pursuit of sustainable development. The CSI also led in developing the Getting the Numbers Right (GNR) tool and database for tracking energy consumption, GHG emissions, and other indicators from the cement industry. In Vietnam, the CSI and GNR have been introduced to the Ministry of Construction (MOC) and cement companies through the Nordic Development Fund’s Pilot NAMA Cement in Vietnam. The data collected from more than 30 cement companies have been analyzed using the GNR tool, and a low-carbon action plan for the sector has been proposed and approved by the MOC in 2017.

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18. All CSI works, including GNR, were transferred to the Global Cement & Concrete Association (GCCA) from January 1, 2019. For more details on GNR, see: https://gccassociation.org/sustainability-innovation/gnr-gcca-in-numbers/.
In the apparel and footwear industry, IDH-led Race to the Top as described is “the first pre-competitive, locally owned multi-stakeholder initiative, that was co-created to reshape the Vietnamese by promoting and enabling embedded sustainable manufacturing practices. . . Race to the Top will demonstrate that significant returns can be reaped by those advancing toward sustainable manufacturing practices. By doing so, Race to the Top will unlock country-wide sustainable production. In the long-term, the objective is to replicate successful segments of the initiative in other quickly emerging apparel markets, such as Ethiopia and Myanmar.”

The Race to the Top works closely with textile and garment companies in Vietnam and has strong support from those companies in the supply chains of major brands (e.g., Puma, Levi’s, and GAP).

Making Vietnam “Energy Efficient”: A Case Study in the Cement Sector

OVERVIEW OF THE CEMENT INDUSTRY IN VIETNAM

For two successive years, Vietnam has maintained its position in the top 3 cement producing countries in the world. Cement and clinker production is expected to rise by 4 to 5 percent to reach 101 to 103 million tons in 2020, with 84 clinker rotary kilns in operation in Vietnam in 2017.

Figure 10: Vietnam as a Top 3 Cement Producer Worldwide (Major countries in worldwide cement production from 2015 to 2019)

Source: Compiled from Statista (2020).

The cement sector accounted for 10 to 15 percent of total energy consumption in industries. Specific energy consumption is still high compared to the world average, at 3,200 to 5,160 MJ per metric ton of clinker and 75.7 to 112.7 kWh per metric ton of cement.

**The Planning Issues**

Four decisions on approving Master Plan for Cement Industry Development (“Master Plan”) have been issued, as listed below:

- Decision No. 970/1997/QD-TTg, issued on November 14, 1997, on approving the revised Master Plan for the period up to 2010;
- Decision No. 164/2002/QD-TTg, issued on November 18, 2002, on approving the revised Master Plan for the period up to 2010, with vision to 2020;
- Decision No. 108/2005/QĐ-TTg, issued on May 16, 2005, on approving the Master Plan for the period up to 2010, with vision to 2020; and
- Decision No. 1488/QĐ-TTg, issued on August 29, 2011, on approving the Master Plan for the period 2011 to 2020, with vision to 2030.

However, many indicators in the approved Master Plans have not been achieved or implemented. Also, many requirements—(1) high-level of mechanization/automation and technology transfer for local knowledge; (2) waste-heat recovery for power generation to reduce electricity use; (3) “waste-to-energy” for environmental protection; (4) control of dust emitted to the ambient environment—were not fulfilled in general. Key specific energy consumptions (e.g., heat and electricity) set out in the Master Plans are unreasonably high, even above the common Best Practice Technology in developed countries.

A proposal for the Master Plan for Cement Industry Development for the period up to 2025, with vision to 2035, was submitted to the government in 2018 but dismissed due to the new Law on Planning.

**The Low-carbon (Mitigation) Action Plan for the Cement Industry**

A Mitigation Action Plan for the cement industry of Vietnam was developed under the Pilot NAMA Cement and submitted to the Ministry of Construction (MOC) in 2016 for review and approval. The ministry then approved the Action Plan in mid-2017.

Table 1: The MOC’s Mitigation Action Plan for the Cement Industry of Vietnam until 2020, With Vision to 2030 (by Decision 802/QD-BXD on July 26, 2017)

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation Action</th>
<th>Description/Expected Results</th>
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<tbody>
<tr>
<td></td>
<td><strong>GROUP A. INSTITUTIONAL AND POLICY FRAMEWORK FOR LOW-CARBON DEVELOPMENT</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Setting up NAMA MRV system for the cement industry</td>
<td>▪ Develop and issue MRV procedures in cement production.</td>
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<td></td>
<td></td>
<td>▪ Elaborate on the GHG Inventory Report for Vietnam’s cement industry.</td>
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<td></td>
<td></td>
<td>▪ Update and synthetize GHG emission data in cement production.</td>
</tr>
<tr>
<td>2</td>
<td>Developing policies and financing tools for implementing low carbon measures in the cement industry</td>
<td>▪ Review policies and develop incentives for: EE improvement, waste heat recovery (WHR) and flue gas processing and reducing clinker content in cement.</td>
</tr>
<tr>
<td>No.</td>
<td>Mitigation Action</td>
<td>Description/Expected Results</td>
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| 3   | Revising the Cement Development Master Plan and developing legal documents toward a low-carbon, energy-efficient industry                                                                                    | ▪ Revise the MOC Cement Master Plan toward low-carbon development.  
▪ Collaborate with MOIT to develop and issue relevant MEPS for cement production.                                                                                                                                              |
| 4   | Conducting compulsory energy audits and developing an Energy & GHG emission database for the cement industry                                                                                                   | ▪ Build database on energy and GHG emissions in the cement industry.  
▪ Use data sharing mechanism with MOIT and MONRE.                                                                                                                                                                              |

**GROUP B. CAPACITY BUILDING**

| 1   | Developing standards and technical guidelines for energy consumption reductions and GHG emission reductions in cement production                          | ▪ Review and synthetize relevant standards and guidelines.  
▪ Develop new standards and guidelines.                                                                                                                                                                                             |
| 2   | Awareness raising on EE and low-carbon development                                                                                                      | ▪ Develop awareness raising plan and materials.  
▪ Use workshops to introduce new technologies/equipment and solutions for EE and GHG control.  
▪ Design trainings for relevant authorities and businesses.                                                                                                                                                                      |

**GROUP C. LOW-CARBON INVESTMENT SUPPORT**

| 1   | Conducting R&D activities on low-carbon topics                                                                                                           | ▪ Review and synthetize current status of technologies, equipment, and GHG emissions in cement production.  
▪ R&D activities on low-carbon topics (e.g., blending, energy, and process management, WHR, material/cement milling).                                                                                                           |
| 2   | Studying and pilot manufacturing equipment for the integrated WHR for power generation.                                                            | ▪ Review and focus studies on WHR systems.  
▪ Design localized WHR models.  
▪ Pilot manufacturing some equipment of WHR systems.                                                                                                                                                                            |

**GROUP D. INTERNATIONAL COOPERATION IN LOW-CARBON DEVELOPMENT**

| 1   | Piloting ESCO model in the cement industry                                                                                                                | ▪ Review international experiences and local practices on ESCO.  
▪ Pilot two Feasibility Studies for ESCO models in the cement industry.                                                                                                                                                           |
| 2   | Proposing potential low-carbon projects to donors and other funding mechanisms for technical and financial supports                                     | ▪ Propose potential low-carbon projects to GCF, NAMA Facility, and other funding mechanisms.  
▪ Organize the implementation of pilot projects and investment.                                                                                                                                                                |
| 3   | Implementing the Paris Agreement in the cement industry with the support of international organizations                                                | ▪ Study the domestic carbon market and other collaboration mechanisms under Article 6, in collaboration with relevant agencies.  
▪ Search for financing opportunities (e.g., concessional loans, credit loan, carbon trading) to conduct pilot projects.  
▪ Implement low-carbon investment projects.                                                                                                                                                                                   |

The action plan has highlighted key EE measures to follow, including:

- Policies and incentives to promote EE in the sector (Activity A2);
- MEPS development and issuance (Activity A3);
- Database on energy and GHG emissions (Activity A4); and
- ESCO model (Activity D1).
**MEPS Enforcement as an EE Measure to Implement the Low-carbon Action Plan**

**HOW MEPS WORKS IN THE CEMENT INDUSTRY UNDER VLEEP-3**

The energy consumption intensity of the cement industry has decreased approximately 13.9 percent from 2012 to 2015 (from 80.6 kgoe per metric ton of cement down to 69.4 kgoe per metric ton of cement), equivalent to 4.81 percent per year (Table 2).

**Table 2: Energy Consumption Improvement throughout VNEEP-2**

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<tbody>
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<td>Energy used</td>
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<td>4,633</td>
<td>4,545</td>
<td>4,359</td>
<td>4,575</td>
<td>4,677</td>
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<td>Output</td>
<td>$10^3$ ton</td>
<td>55,801</td>
<td>58,217</td>
<td>56,353</td>
<td>57,516</td>
<td>61,000</td>
<td>67,400</td>
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</tr>
<tr>
<td>Intensity</td>
<td>kgoe/ton</td>
<td>77.9</td>
<td>79.6</td>
<td>80.7</td>
<td>75.8</td>
<td>75.0</td>
<td>69.4</td>
<td>74.9</td>
</tr>
</tbody>
</table>

Source: Analysis based on RCEE-NIRAS, Evaluation of Vietnam Energy Efficiency Program - Phase II.

Under VNEEP-3, specific EE targets for the cement sector have been indicated as follows:

(i) The period up to 2025: reduce minimum 7.5% of the average energy consumption in the cement sector as compared to the period 2015 – 2018;

(ii) The period up to 2030: reduce minimum 10.9% of the average energy consumption in the cement sector as compared to the period 2015 – 2018.

Figure 11 presents the results from a energy sector performance assessment study, conducted within the scope of support by USAID’s Vietnam Low Emission Energy Program (V-LEEP) in collaboration with the MOIT and MOC. The MEPS are suggested for both thermal energy consumption (3,728 MJ per metric ton of clinker) and electric power consumption (95.6 kWh per metric ton of cement).

**Figure 11: MEPS Enforcement on Energy Consumptions (thermal and power) in Cement Plants**

The following activities are proposed for MEPS enforcement in the cement industry of Vietnam:

- The MOIT advises the MOC to issue MEPS for the cement sector.
- The MOIT should propose a transparent energy pricing scheme to the government to encourage cement plants to invest in EE improvement.
- The MOIT should work with Ministry of Finance on establishing the EE Promotion Fund to provide loan/credit to cement plants for renovating the production line and optimizing operation.
- The MOIT should propose to the government and the National Assembly to revise the EE Law and relevant regulations to enforce MEPS issuance and execution.

**Potential Impact**

MEPS enforcement can help reducing 38 GWh electricity and 29 million GJ thermal consumption, equivalent to 2.77 MtCO₂ reduction by 2030. Air quality will also be improved due to better process control.

**Political Feasibility**

- Politburo Resolution 55 has implied the importance of EE to energy security.
- The resolution also requested a restructuring of energy intensive industries and enforcement of compulsory EE standards and regulations.
- There will likely be potential push-back from vested group connected to provincial authorities.

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This report is made possible by the generous support of BP.

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