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Nordic Council of Ministers



NORDIC PARTNERSHIP INITIATIVE:

CEMENT SECTOR NAMA READINESS PROGRAMME IN VIETNAM

The NAMA Readiness Programme for Vietnam's cement sector has been on-going since March 2014. It focuses on improving the energy efficiency of the country's cement sector and mitigating the resulting carbon emissions. The Programme is expected to enable Vietnam to prepare for a full-scale Nationally Appropriate Mitigation Action (NAMA) in the cement sector. The NAMA would count as a part of Vietnam's contribution under the UN Framework Convention on Climate Change (UNFCCC) and allow the sector to attract international support towards the implementation of the proposal.

The Readiness Programme is supported by the Nordic Development Fund, established by Denmark, Finland, Iceland, Norway and Sweden. It is part of the Nordic Partnership Initiative on Up-Scaled Mitigation Action (NPI) under the Nordic Working Group for Global Climate Negotiations (NOAK). The initiative has been supporting climate change mitigation efforts in developing countries since 2011, with a focus on Peru and Vietnam. As such the NAMA Readiness Programme can build on the long-term cooperation with Vietnam under the NPI, in particular the earlier feasibility studies that identified the cement sector as the most promising for NAMA development in the country.



Photo: Sara Almqvist, Swedish Environmental Protection Agency.

NEW NORDIC CLIMATE SOLUTIONS



The Nordic Partnership Initiative and Vietnam’s Cement Sector

Nordic Partnership Initiative (NPI)

The aim of the Nordic Partnership Initiative is to demonstrate how innovative international climate finance solutions can achieve sector-wide greenhouse gas (GHG) emission reductions in developing countries. Under the NPI two NAMA Readiness Programmes are currently being completed in Peru’s waste sector and Vietnam’s cement sector. The countries and sectors have been carefully selected using a bottom-up methodology drawing heavily on the input of local stakeholders. During the NAMA Readiness Programmes concrete financeable proposals of Nationally Appropriate Mitigation Actions (NAMAs) are developed as proof-of-concept activities that will drive the development and implementation of further NAMAs¹.

The NAMA designs are expected to include different types of mitigation actions, such as pilot projects, targeted policy instruments and financial schemes that will take place over the short, medium and long term. A key aspect is the financial sustainability of these actions and their ability to attract domestic co-financing, including plans for the phase-out of international support in the long term.

At a time when the process of matching NAMAs with developed country support is still at an early stage, the Programmes are proof-of-concept activities that provide lessons learned for the development and implementation of future NAMAs. The Nordic sponsors of the NPI are confident that the Readiness Programmes will enhance the tool box of options available to developing countries to address climate change.

Vietnam’s Economy & Cement Sector

Vietnam is the world’s 14th most populous country, with 90.73 million inhabitants in 2014. The population continues to grow rapidly at a rate of approximately 1% per year. Vietnam also has a fast-growing economy with an average annual growth rate of more than 6.5% between 2004 and 2014. The country was removed from the list of least developed countries (LDCs) in 2003 and is now considered by the World Bank as a lower middle-income country. Per-capita Gross Domestic Product of Vietnam based on Purchasing Power Parity is now 5,629 USD, almost double what it was 10 years ago.



Photo: Jürgen Wiesmann, GreenStream

is a basic construction material, and its production and consumption are directly linked to economic activity. In recent years Vietnam’s cement sector has undergone significant growth as the country has replaced imports by domestic production and begun to export cement in order to reduce inventory.

Vietnam is now among the top 10 cement producing and consuming countries in the world, with production totalling 65 million tonnes in 2013. The state-owned enterprise VICEM is the dominant producer and accounts for 37% of total installed clinker capacity. The remainder is accounted for by privately-owned cement plants and joint ventures with international corporations.

In August 2011 Vietnam adopted the “Master Plan for Development of the Cement Industry for the 2011-2020 period, with a vision to 2030” under Decision No.1488/QĐ-Ttđ by the Prime Minister. The Plan suggests that during this time the country’s cement production will again double from 59 million tons in 2013 to 125 million tons in 2030.

In Vietnam the cement sector is one of the most energy-intensive industries, with energy typically accounting for 30%-40% of the production costs. While the Master Plan includes ambitious targets to reduce the energy intensity of the sector, even the most recently constructed cement plants generally do not meet these targets.

As a result, the cement sector clearly presents an excellent opportunity to save energy and reduce greenhouse gas emissions. To reach this potential it is therefore vital to provide incentives for emission reductions and thus firmly incorporate climate and energy efficiency considerations into the sector’s decision-making.

¹NAMAs are large-scale host country driven emission reduction actions that are supported and enabled by international and domestic financing, technology, and capacity building.

The NAMA Readiness Programme focuses on the cement sector. Cement

Objectives of the Programme

The overall objective of the Readiness Programme is to strengthen Vietnam's capacity to prepare, propose and implement a full-scale scheme of a clearly specified NAMA in the cement sector. The NAMA Proposals are identifying the most promising options to mitigate greenhouse gas emissions in the sector and should enable Vietnam to attract international climate finance through the carbon market and other channels, along with support in the form of technology transfer and capacity building.

The readiness activities include the following concrete tasks:

- Collecting up-to-date data on emission reduction potential
- Developing baseline emission projections
- Estimating the emission reduction impact of mitigation actions
- Developing a measurement, reporting and verification (MRV) system for emissions and co-benefits
- Identifying barriers to mitigation actions and proposals to overcome them
- Identifying appropriate support instruments for mitigation actions
- Carrying out relevant institutional arrangements, capacity building and training.

The budget of the NAMA readiness Programme is €1.6 million, which is financed by the Nordic Development Fund (NDF) and the government of Vietnam. The Ministry of Construction of Vietnam (MOC) is responsible for the

management of the overall Programme, which is carried out by a consultant consortium² that was selected following an international tender procedure. The Programme was started in March 2014 and is expected to be completed by April 2016.

Progress and Results

The activities under the NAMA Readiness programme have so far concentrated on the following topics.

Analysis of Existing Policies

The main legislation which governs the cement industry in Vietnam is the Master Plan for the Development of the Cement Industry, which is revised periodically. It shows a strong desire by the government to replace cement imports by domestic production in a sustainable way.

Existing energy policies primarily set quite ambitious energy efficiency targets for new cement plants. However, these are rarely achieved in practice, at least as far as thermal energy is concerned. There are not yet specific incentives to promote low carbon options such as waste heat recovery (WHR) or the use of alternative kiln fuels, based on biomass or wastes.

The cement product standards are quite restrictive, limiting the types of cement that can be sold in Vietnam and therefore the opportunities for cement producers to substitute the energy-intensive clinker with other materials.

Many stakeholders feel that the energy costs in Vietnam are subsidized at a level below the international market price. This constitutes a barrier for cement plants to invest in energy efficiency measures.

Compilation of Cement Sector Data Base

There is currently no regulation in place on the monitoring and reporting of CO₂ emissions in the cement sector.



Photo: Ulla Jennische, Swedish Environmental Protection Agency

Although all plants provide general information on gas emissions in periodic reports to the environmental authorities, data on CO₂ emissions is not regularly monitored and recorded.

As a result, the project team has had to conduct a nation-wide survey to develop the first comprehensive database on energy and CO₂ for the cement sector in Vietnam. The database contains information from 47 of 55 cement plants. With the coverage of 85% of the installations and 87% of clinker production in Vietnam the database can be considered as representative for the performance of the overall cement sector in Vietnam.

The database forms the blueprint for the NAMA's Monitoring, Reporting and Verification (MRV) system. The system tracks not only GHG emissions but also the environmental and social co-benefits associated with the NAMA, in line with the best international practices as developed by the Cement Sustainability Initiative of the World Business Council for Sustainable Development.

²The consortium consists of 5 companies: NIRAS, South Pole, Perspectives, VNEEC and RCEE-NIRAS.

The Low-Carbon Future of Vietnam's Cement Industry

Scenario Development

Under the Readiness Programme three cement production scenarios have been considered. In the “Master Plan” scenario Vietnam’s cement production would double over the next 15 years. This scenario implies 1200 kg cement production capacity per capita and would make Vietnam fourth in the world in terms of per capita cement production, lagging only China, Saudi Arabia and Qatar. These high levels of production would most likely exceed domestic demand significantly and would result in surplus for export, which may not be desirable from an economic and environmental point of view.



Photo: Hannu Eerola, NDF

Therefore two alternative production scenarios have been developed. In the first scenario capacity expansion is stopped once the sector capacity reaches 800 kg cement per capita per year. This corresponds to a 23% increase from today’s levels and would put Vietnam in the same range as South Korea, Turkey and Iran. In the second scenario capacity is maintained at today’s level, i.e. 650 kg/capita.

The production scenarios are combined with six energy and CO₂ intensity scenarios for the year 2030. The scenarios range from a maximum of 800 kg CO₂ per ton of cement to a minimum of 545 kg. This is an improvement potential of up to 27% compared with the average level of 740 kg that was achieved in 2013. The 2013 starting point is somewhat higher than that of other countries in South-East Asia, such

as India (600 kg), the Philippines (690 kg) or Thailand (700 kg).

Recommended Mitigation Actions

As part of the NAMA Readiness Programme proposals have been developed for a USD1.8 billion investment programme to improve energy efficiency and lower GHG emissions in the cement sector. The recommendations focus on mitigation options that not only reduce GHG emissions but also generate cost savings for participating cement plants.

Blended cement is a particularly attractive option that saves energy and costs, as the energy-intensive clinker is replaced by other materials. In Vietnam the most promising substitutes are limestone and pozzolana. Fly ash from coal-fired power plants and blast furnace slag from steel mills can also make a contribution to GHG emission reductions, particularly if new cement standards regarding blended cement are released.

A second group of cost-efficient mitigation actions focus on the application of advanced energy efficiency technologies. Waste heat recovery systems allow the capture of waste heat from the kilns for the purpose of electric power generation. The electric power can then be used either on-site or delivered to the power grid. Multi-channel burners increase the combustion efficiency of the kiln fuels, as they require a significantly reduced primary air volume intake.

Finally, there is a large potential in the adoption of best available operational practices and modern automation and controls systems. Many of Vietnam’s cement plants already use best available technology, such as the pre-heater / pre-calciner technology. However, their current operational performance indicates that there is significant room for improvement. Such operational improvement is especially

needed in the recently constructed and privately-owned installations.

The use of alternative fuels, such as biomass or waste-derived fuels, can also be substantially increased in order to lower GHG emissions from the combustion of fossil fuels. However, this will require substantial investment in waste collection, management, handling, storage and feeding infrastructure as well as in waste operational management and practice.



Photo: Jürgen Wiesmann, Greenstream

Recommended Enabling Activities

In addition to the above mitigation actions that directly affect GHG emissions at the cement plants, the NAMA Readiness Programme has identified a set of enabling activities. These are required to ensure that cement plants have proper incentives and a well-defined legal and institutional framework, within which to undertake the necessary investments.

Issues for NAMA Implementation and Financing

Monitoring, Reporting & Verification Requirements

Setting up an MRV system for the cement sector's GHG emissions is one of the key enabling activities identified by the NAMA Readiness Programme. The database that has been developed as part of the Programme forms the basis for the NAMA's MRV system. The system shall track not only GHG emissions but also the environmental and social co-benefits associated with the NAMA in line with internationally accepted practices. This is necessary to reassure potential international donors of the credibility of the NAMA and its capacity to deliver verified emission reductions through mitigation actions that contribute to the Vietnam's sustainable development.

To effectively implement the MRV system it will be necessary to establish a legal obligation for all cement companies to participate in the MRV, while improving quality and credibility of the current in-plant monitoring practices.



Photo: Ulla Jennische, Swedish Environmental Protection Agency

Legal and Institutional Framework

The MOC will be the implementing agency for the NAMA. The ministry has been fully committed to the Programme and has ensured that the recommendations are country-driven and in line with Vietnam's national priorities and strategies.

The Ministries of Natural Resources and Environment, of Planning and Investment and of Finance will also play

important roles in the implementation of the actual NAMA.

Financing

The mitigation actions identified under the NAMA Readiness Programme require a total investment volume of USD 1.8 billion between 2015 and 2030. Many of the investments are inherently economically attractive and may only require the removal of certain barriers as well as the creation of an interesting investment environment and incentive package to attract the required commercial investments from Vietnam's cement plants. The cost of the enabling activities is estimated at USD15 million, i.e. less than 1% of the total investment required.

There are a large variety of financing sources and instruments which could potentially support the implementation of the cement sector NAMA in Vietnam. Since many of the mitigation actions are economically attractive for the cement companies, private sources should be the main source of NAMA finance. Funding from international donors or the carbon market will be sought to put in place the enabling activities, to finance pilot projects and to create incentive schemes that are able to catalyze investments by the cement industry. Such incentives could be designed in the form of preferential loans, performance guarantees or as results-based payments, where companies receive payments based on the demonstrated energy savings or GHG emission reductions they have achieved.

Stakeholder Outreach

With a workshop in Hanoi on October 14, 2015 the preliminary results of the NAMA Readiness Programme were introduced to a wide group of stakeholders. More than 80 representatives from the relevant ministries, cement companies, industry associations and international organisations attended the workshop.

The coming months will see further consultation and capacity building activities, with a focus on seeking buy-in from Vietnam's cement companies and introducing the NAMA proposal to potential international donors for the implementation phase of the NAMA.

Partners involved in the NAMA Readiness Programme

- The Nordic Council of Ministers
- The Nordic Working Group for Global Climate Negotiations (NOAK)
- Ministry of Construction of Vietnam (MOC)
- Nordic Development Fund (NDF)



Photo: Tung Le Anh, VNEEC (Energy and Environment Consultancy Joint-stock Company)

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Did you know that...

- Vietnam's population is 90.73 million and growing by 1% per year in the period 2009–2014. It is the 14th most populous country in the world.
- In 2014 Vietnam was among the top 10 cement producing countries in the world.
- Per-capita GDP based on purchasing power parity was 5,629 USD 2014. The average annual GDP growth rate from 2004 to 2014 was 6.5%.
- The CO₂ intensity of Vietnam's cement industry is significantly higher than that of India, Thailand or the Philippines.
- 92% of Vietnam's cement is produced using Best Available Technology (BAT).
- Many activities that reduce greenhouse gas (GHG) emissions generate significant energy cost savings.

