

Technology potential assessment for low carbon technology growth in Vietnam

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Overview

Policies on climate change responses

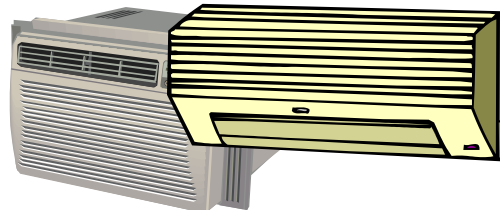
- *Constitution 2013;*
- *Resolution No. 24-NQ/TW of the Central Executive Committee;*
- *Law on Environmental Protection;*
- *National Strategy on Green growth ;*
- *National Strategy on Climate Change;*
- *Project on Greenhouse gas emission management; management of carbon credit business activities to the world market*
- *National Target Program to Respond to Climate Change ;*
- *Support Program to Respond to Climate Change*
- *Action Plan to Implement the Paris Agreement*

Greenhouse gas emissions targets

- *To develop the low carbon economy;*
- *To reduce the GHG emissions per unit of GDP by 8-10% compared to 2010 levels*
- *To reduce the intensity of GHG emissions by 8-10% compared to 2010 levels;*
- *To reduce the energy consumption per unit of GDP by 1-1.5% per year.*
- *To reduce the GHG emissions from energy activities by 10% to 20% compared to BAU.*

Low carbon growth

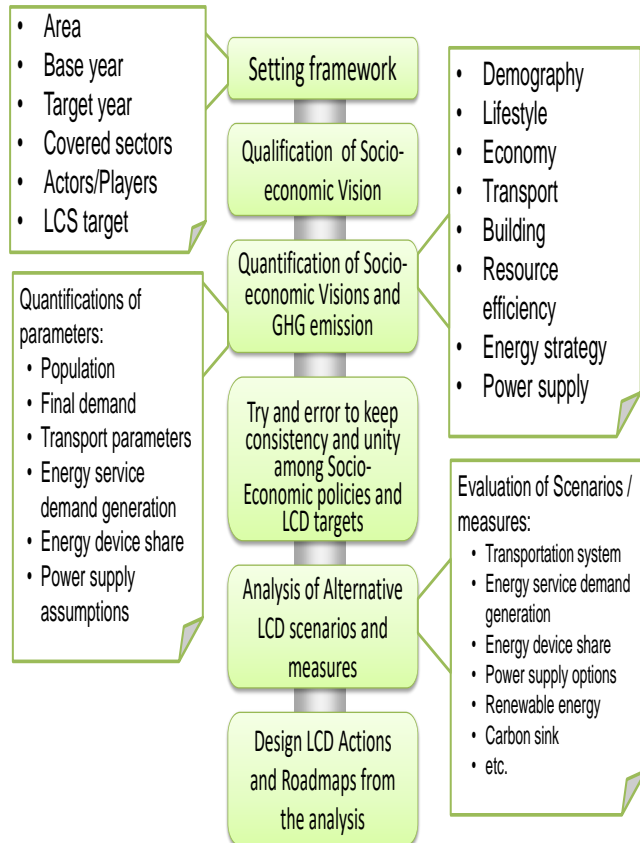
- In order to effectively address the climate change issue, it is necessary to mobilize the adequate technological, market and financial elements to achieve low carbon growth worldwide
- The enhancement of the use of low-carbon technologies and products should widen in factories in many sectors such as renewable energy, high-efficiency electricity production, electrical appliances, low emissions and energy savings vehicles.
- Identifying a low carbon society by integrating those products and technologies into appropriate services, systems and infrastructure is also important.



Asian Pacific Integrated Model (AIM)

AIM: simulation model

- Technology model with over 400 options
- Economic model to assess the economic impacts
- Models for sectors like population, transportation, industry, energy, etc

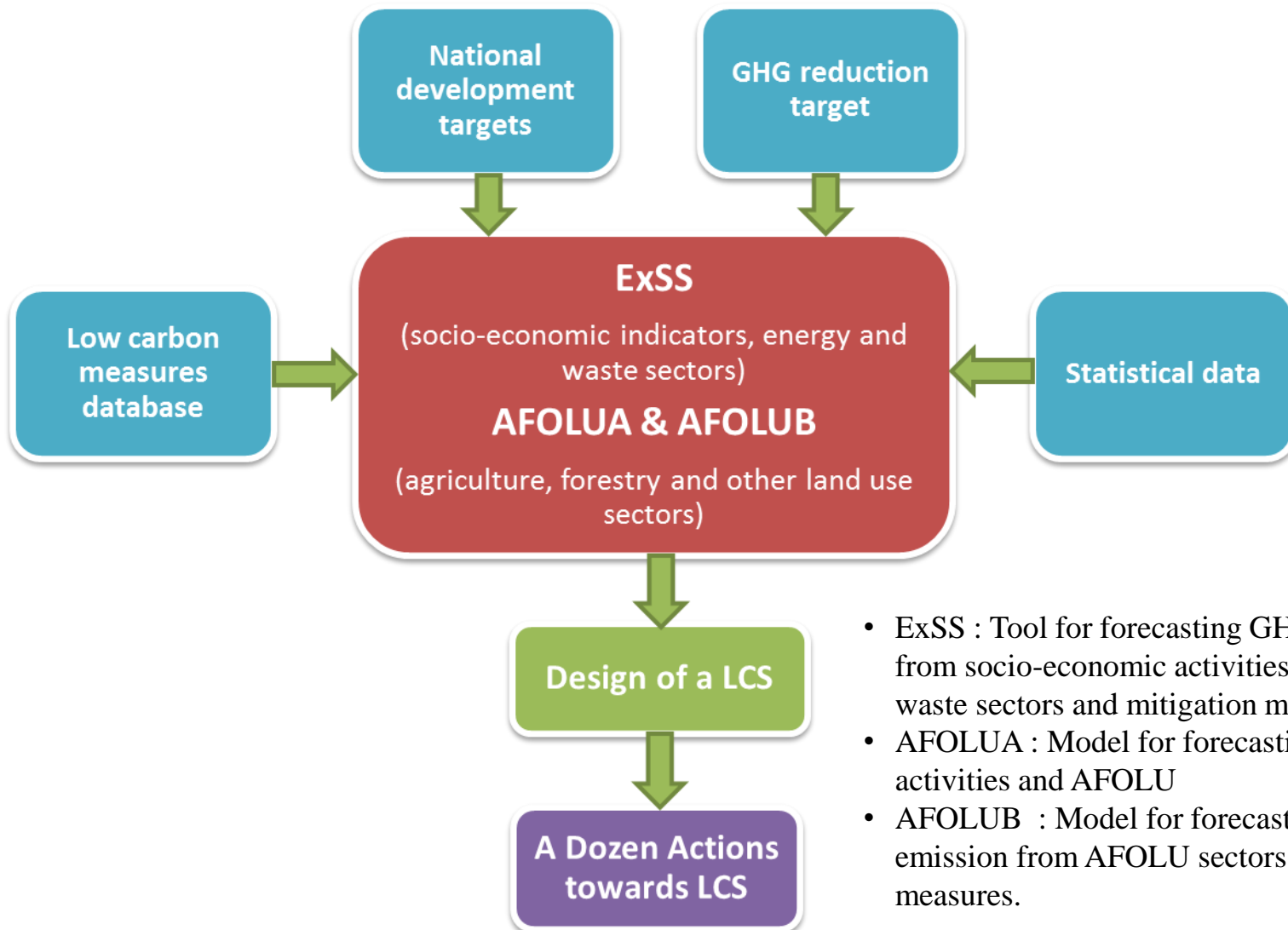


AIM: network

- International cooperation set since 1994
- Researchers and policymakers are from China, India, South Korea, Thailand, Indonesia, Malaysia, Vietnam, Nepal, Cambodia, Bangladesh, Taiwan, Australia, USA, EU ... and Japan.



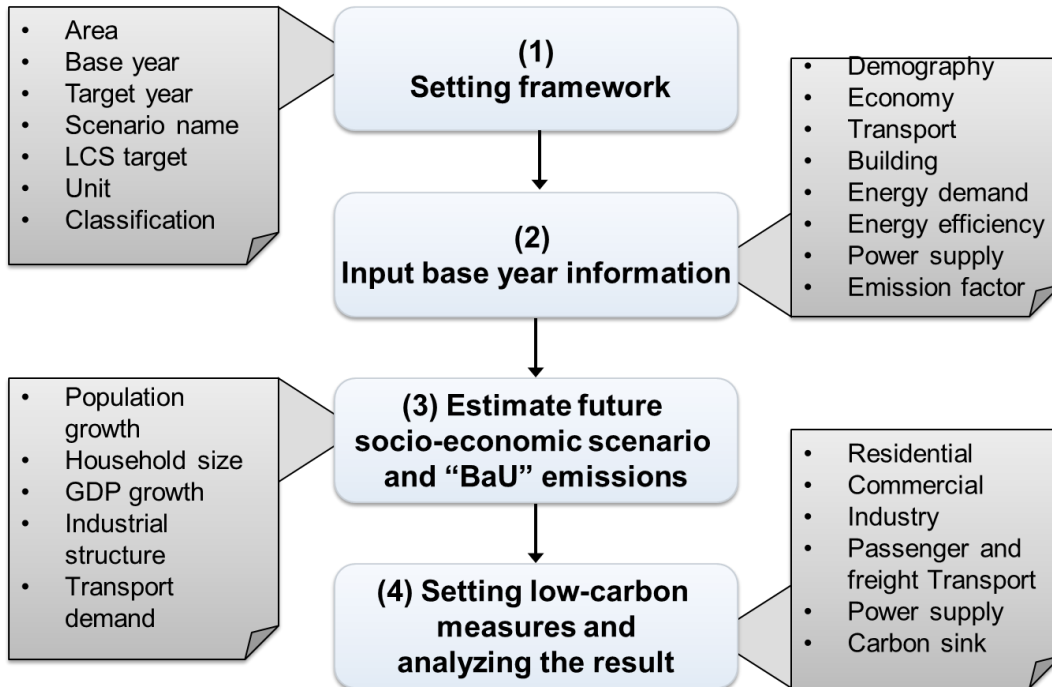
Research methodology



- ExSS : Tool for forecasting GHG emissions from socio-economic activities in energy and waste sectors and mitigation measures
- AFOLUA : Model for forecasting land use activities and AFOLU
- AFOLUB : Model for forecasting GHG emission from AFOLU sectors and mitigation measures.

Research methodology

ExSS



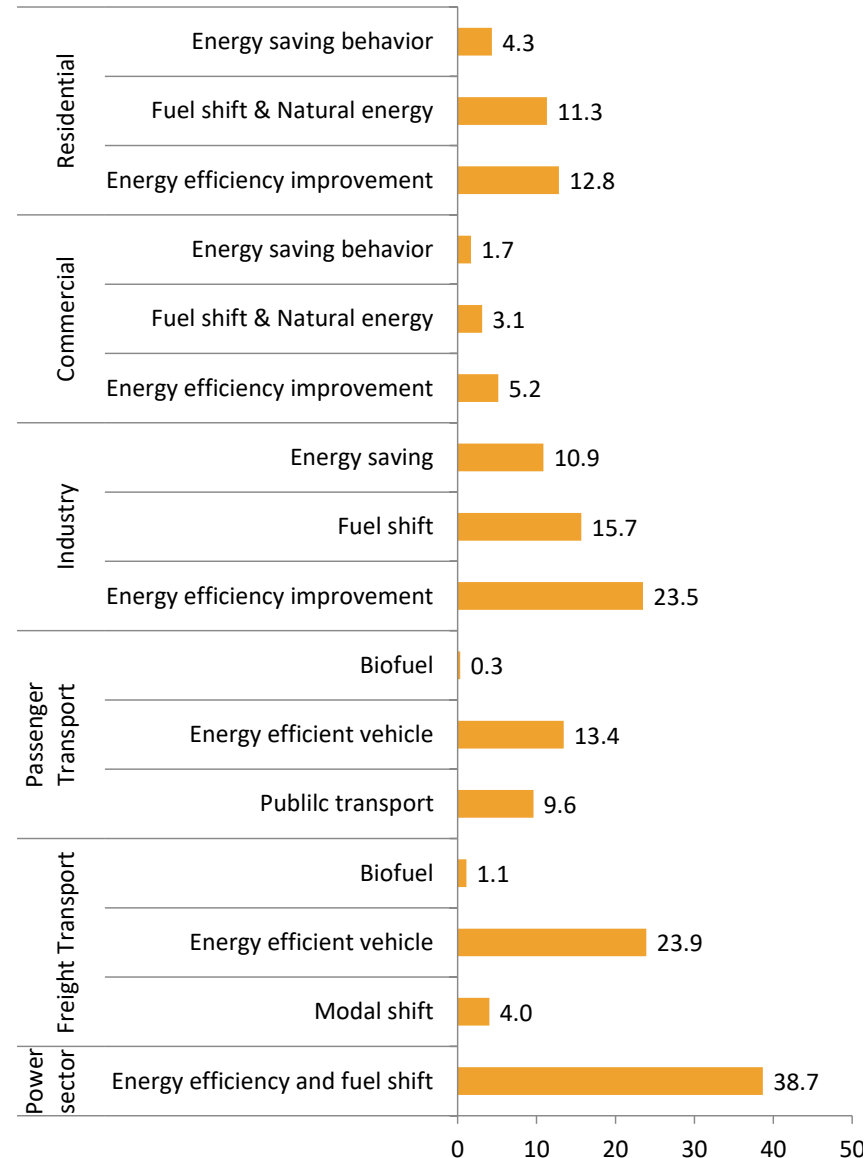
- Forecasting socio-economic activities
 - Households, industrial production, transportation need, construction materials
- Forecasting energy supply and demand
- Forecasting GHG emissions and emission reduction by measurement

Energy scenario

- Energy consumption in the industrial and transport sectors should be considered under the trend of industrialization and increase of travel demand in the future.
- Estimated GHG emission in 2030BaU scenario will be 521.9 MtCO₂eq (6.4 times higher than the 2005 level), and in 2030CM scenario will be 343.4 MtCO₂eq (reducing 30%).
- Improvement of energy efficiency and fuel conversion in the energy sector are significant contributions to reduce GHG emission, 38.7 MtCO₂

GHG emission in energy sector

Sector	MtCO ₂ eq					
	2005	2030BaU	2030CM	2030BaU/ /2005	2030CM/ /2005	2030CM/ 2030BaU
Residential	14.8	110.2	68.2	7.4	4.6	0.6
Commercial	6.2	41.3	27.9	6.7	4.5	0.7
Industry	38.8	256.5	185.4	6.6	4.8	0.7
Passenger transport	10.0	46.5	23.1	4.7	2.3	0.5
Freight transport	11.3	67.3	37.8	6.0	3.4	0.6
Total	81.0	521.9	342.4	6.4	4.2	0.7



Contribution of low carbon measures
in energy sector

Dozen Actions towards LCS in Vietnam in 2030

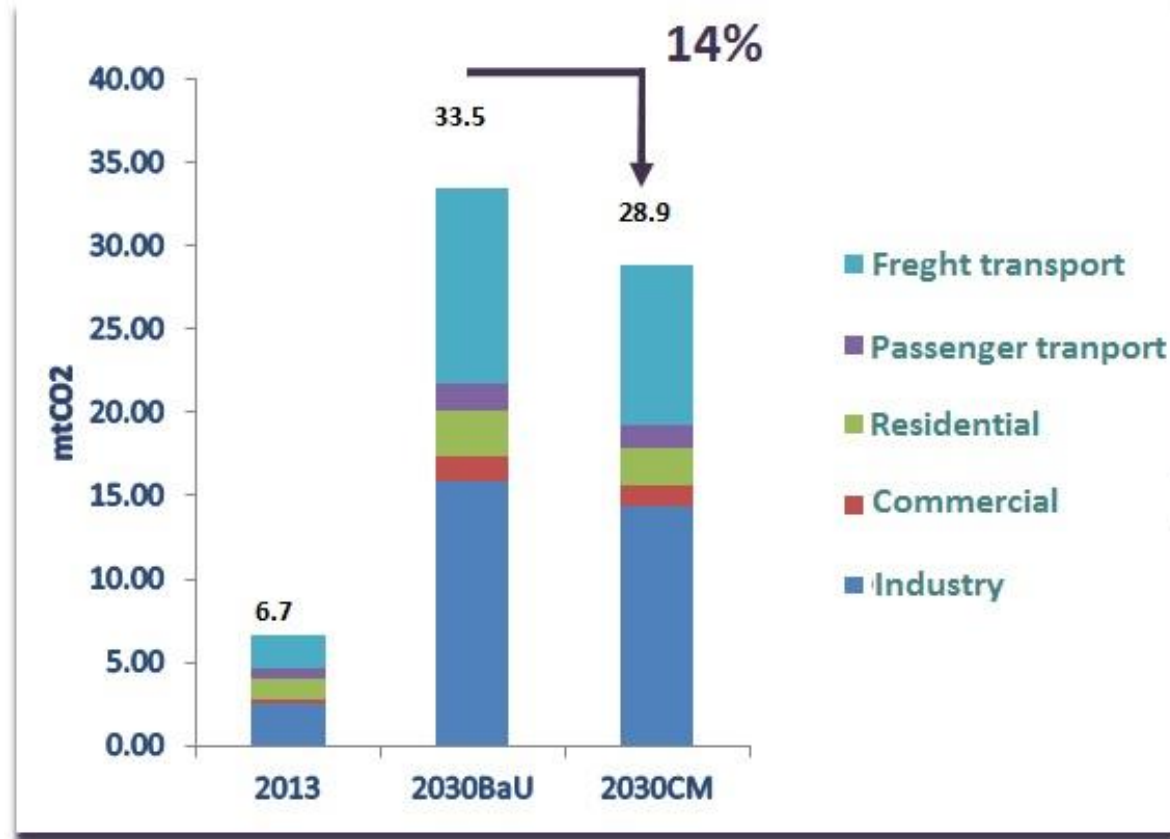
GHG mitigations
(MtCO₂eq)

AFOLU sectors	41.7
Action A1 Livestock Manure Management	2.8
Action A2 Livestock Enteric Fermentation	3.3
Action A3 Rice Cultivation Management	11.9
Action A4 Soil Management	2.9
Action A5 Forest and Land Use Management	20.9
Energy sectors	179.5
Action E1 Green Building	14.4
Action E2 Convenient Transport	15.0
Action E3 Energy Saving Behavior	16.9
Action E4 Energy Efficiency Improvement	78.8
Action E5 Fuel Shift in Industry	15.7
Action E6 Smart Power Plants	38.7
Waste sector	35.6
Action W Smart 3R	35.6
Total	256.9

Low carbon technology growth in several cities in Vietnam

Low carbon scenario: a case of Hai Phong city

GHG emissions reduction

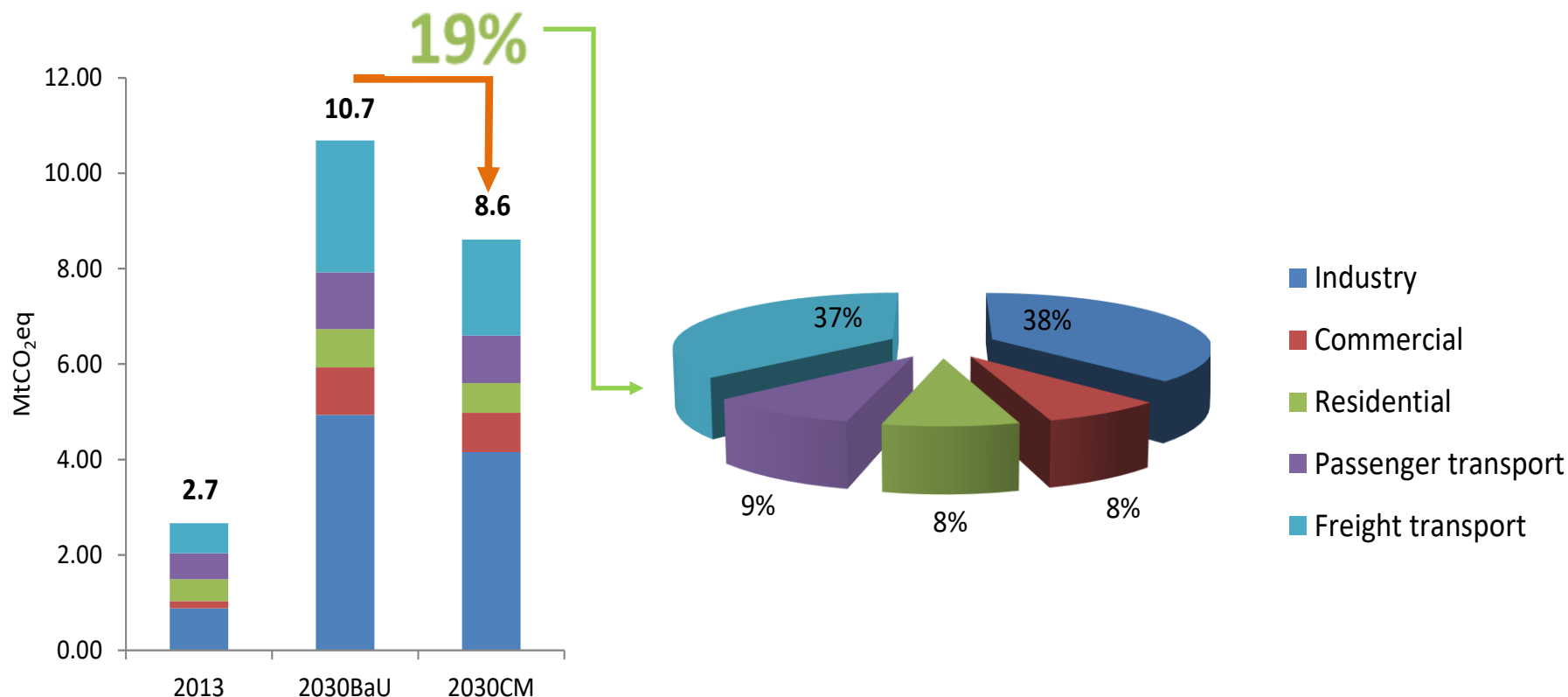


Haiphong city can reduce 14% of the total GHG emissions by 2030CM (in the range of 10-20% of national mitigation targets as announced in the green growth strategy and in the range of 8-25% mentioned in Vietnam's INDC

Low carbon scenario: a case of Hai Phong city

Climate change related actions	Industry	Commercial	Residential	Passenger transport	Freight transport	Total (ktCO ₂ eq)
Action 1. Green industry To promote the use of energy-saving equipment and alternative fuels	1,477					1,477
Action 2. Green city To popular low-energy buildings (EMS, insulation, alternative energy)		168	60			228
Action 3. Energy efficiency To promote the use of energy-saving equipment/devices		130	233			363
Action 4. Clean transport Fuel-efficient vehicles and use of alternative fuels				284	2,257	2,541
Action 5. Green energy To develop power plants using renewable energy		30	4			34
Total (ktCO₂eq)	1,477	329	296	284	2,257	4,643

Low carbon scenario: a case of Da Nang city



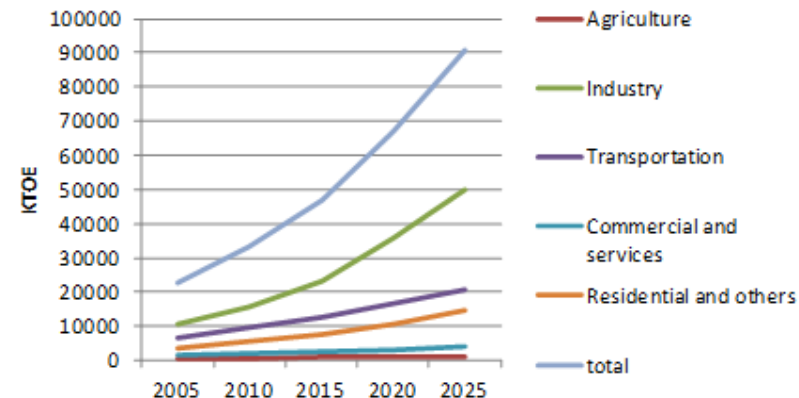
Da Nang city can reduce 19% of the total GHG emissions by 2030CM (in the range of 10-20% of national mitigation targets as announced in the green growth strategy and in the range of 8-25% mentioned in Vietnam's INDC)

Low carbon scenario: a case of Da Nang city

Climate change related actions	Industry	Commercial	Residential	Passenger transport	Freight transport	Total (ktCO ₂ eq)
Action 1. Smart industry To promote the use of energy-saving equipment and alternative fuels	777					777
Action 2. Smart buildings To popular low-energy buildings (EMS, insulation, alternative energy)		47	49			96
Action 3. Energy efficiency To promote the use of energy-saving equipment/devices		110	124			233
Action 4. Smart transport Fuel-efficient vehicles and use of alternative fuels				196	756	952
Action 5. Green energy To develop power plants using renewable energy		16	5			21
Total (ktCO₂eq)	777	173	178	196	756	2,079

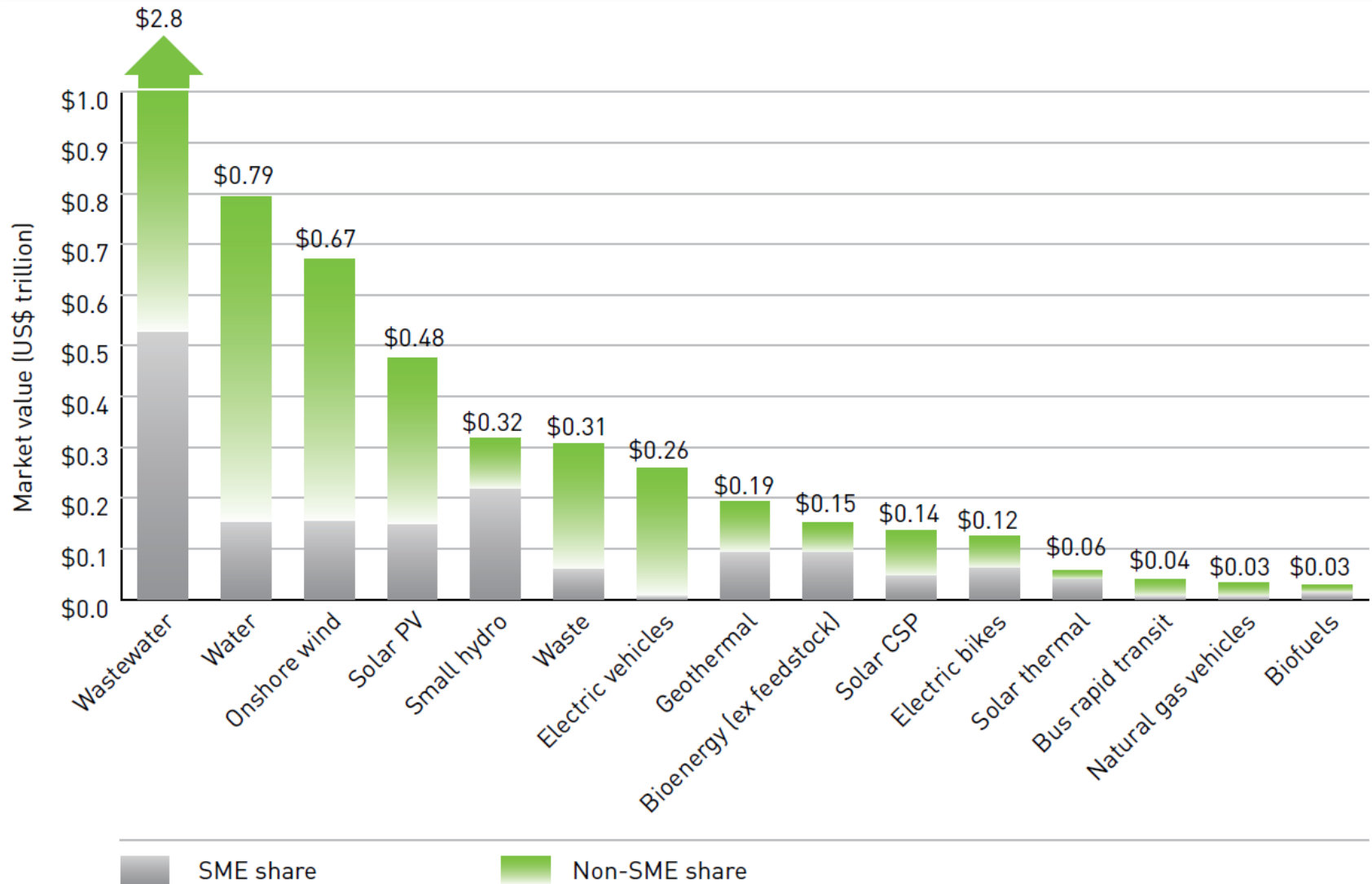
Roles and opportunities of enterprises

- ✓ Currently, there are about 500,000 Small and Medium Enterprises (SMEs), accounting for around 97.5% of the total number of operating enterprises nationwide. Every year, SMEs contribute about 40% of GDP and attract 51% of the country's labor force.
- ✓ SMEs contribute 45% of total energy consumption in Vietnam's industry and show the great prospects in energy efficiency and GHG emissions reduction.
- ✓ SMEs play an important socio-economic role and have great potentials to contribute to green growth in Vietnam.
- ✓ Some efforts to introduce low carbon technologies and energy efficiency have been reported in the manufacturing industry in Vietnam such as steel, cement and paper manufacturing industries.
- ✓ SMEs are also an important factor in innovating low carbon technologies



Energy demands by sector (MOIT, 2012)

Quy mô thị trường công nghệ các bon thấp



Quy mô thị trường cho 15 công nghệ cacbon thấp ở các nước đang phát triển vào năm 2030

Conclusions

Opportunities for low carbon technologies in Vietnam

- To be in line with current policies of the Party and the State;*
- To promote the cooperation between Vietnam and the international community;*
- High potential for greenhouse gas reduction in Vietnam*

Low carbon technologies will help:

- To effectively respond to climate change;*
- To improve national competitiveness.*
- To enhance the participation of the private sectors and communities.*

Low carbon technology still faces challenges due to:

- Methods;*
- Capacity, research and technology;*
- Organizational structure, policies and incentives*