Implementing NDC & SDG-7 in Asia: Low Carbon Technology Development Pathways

ADB TA: 9690

Anindya Bhattacharya PhD
June 2020
Outline

<table>
<thead>
<tr>
<th>Status of SDG-7 &amp; NDC target achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope of the study</td>
</tr>
<tr>
<td>Regional baseline of energy and technology mix</td>
</tr>
<tr>
<td>National baselines</td>
</tr>
<tr>
<td>Initial assessments of progress on NDC and SDG-7 in the region</td>
</tr>
<tr>
<td>Focusing on balanced approach of target achievement / Post pandemic readjustment</td>
</tr>
<tr>
<td>Way forward</td>
</tr>
</tbody>
</table>
1

Status of SDG-7 & NDC target achievement
Status of SDG-7 target achievement

Access to clean cooking

Source: Climate Action Tracker, ESMAP, 2018
Status of SDG-7 target achievement

Access to electricity

Source: Climate Action Tracker, ESMAP, 2018
Status of SDG-7 target achievement

Renewable energy penetration

Source: Climate Action Tracker, ESMAP, 2018
# Status of NDC Target Achievement

## Global status of NDC targets

<table>
<thead>
<tr>
<th>CRITICALLY INSUFFICIENT</th>
<th>HIGHLY INSUFFICIENT</th>
<th>INSUFFICIENT</th>
<th>2°C COMPATIBLE</th>
<th>1.5°C PARIS AGREEMENT COMPATIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4°C+ WORLD</td>
<td>&lt; 4°C WORLD</td>
<td>&lt; 3°C WORLD</td>
<td>&lt; 2°C WORLD</td>
<td>&lt; 1.5°C WORLD</td>
</tr>
<tr>
<td>RUSSIAN FEDERATION</td>
<td>ARGENTINA</td>
<td>AUSTRALIA</td>
<td>BHUTAN</td>
<td>MOROCCO</td>
</tr>
<tr>
<td>SAUDI ARABIA</td>
<td>CHILE</td>
<td>BRAZIL</td>
<td>COSTA RICA</td>
<td>THE GAMBIA</td>
</tr>
<tr>
<td>TURKEY</td>
<td>CHINA</td>
<td>CANADA</td>
<td>ETHIOPIA</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>INDONESIA</td>
<td>EU</td>
<td>INDIA</td>
<td></td>
</tr>
<tr>
<td>UKRAINE</td>
<td>JAPAN</td>
<td>KAZAKHSTAN</td>
<td>KENYA</td>
<td></td>
</tr>
<tr>
<td>VIET NAM</td>
<td>SINGAPORE</td>
<td>MEXICO</td>
<td>PHILIPPINES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOUTH AFRICA</td>
<td>NEW ZEALAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOUTH KOREA</td>
<td>NORWAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UAE</td>
<td>PERU</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SWITZERLAND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Climate Action Tracker, ESMAP, 2018*
Status of NDC Targets in Case Study Countries

Viet Nam

Indonesia

Source: Climate Action Tracker, ESMAP, 2018
Status of NDC Targets in Case Study Countries

India

China

Source: Climate Action Tracker, ESMAP, 2018
Steps to be taken to accelerate activities

Advancing SDG-7 Implementation
- Top priority for clean cooking
- Enhanced electricity access
- Accelerated RE penetration
- Doubling the SDG-7 financing
- Investment in data collection system and data analysis

Strengthening interlinkages between SDG7 & other SDGs
- Harness the cross sectoral interlinkages
- Gender equality and women empowerment
- Promoting low carbon cities

Addressing regional priorities
- Strengthening regional cooperation
- Ending energy poverty

Transition towards sustainable inclusive and equitable energy future
- Promoting transformational investment through inclusive energy system and decentralized RE integration
- Life style change for sustainable living
- Strengthening decision making process by improving energy data collection, analysis and monitoring
2 Scope of the TA
Goals and objectives

GOALS

Developing implementable action plans for NDCs and SDG7 in the region including technology roadmap and finance

- Disseminate the knowledge through workshops/seminars and knowledge products
- Develop the Energy Mix outlook and technology pathways for the selected sub regions
- Develop low carbon energy technology roadmap for the selected countries
- Develop low-carbon energy pilot projects for the selected cities
## Methodology for integrating NDC and SDG-7 policies

<table>
<thead>
<tr>
<th>SDG7 Target</th>
<th>SDG7 Indicator</th>
<th>Model Implementation</th>
</tr>
</thead>
</table>
| **7.1** By 2030, ensure universal access to affordable, reliable and modern energy services | **7.1.1** Proportion of population with access to electricity | • Electricity demand projections incorporating universal access assumptions  
• Transition to clean technologies for cooking, transportation and buildings  
• Subsidies for transitions to modern fuels. |
| **7.1.2** Proportion of population with primary reliance on clean fuels and technology | | |
| **7.2** By 2030, increase substantially the share of renewable energy in the global energy mix | **7.2.1** Renewable energy share in the total final energy consumption | • Constraint on renewable energy share in each region  
• Combined with long-term emission constraints aligned with the Paris Agreement to reflect the important role of clean energy in achieving climate targets. |
| **7.3** By 2030, double the global rate of improvement in energy efficiency | **7.3.1** Energy intensity measured in terms of primary energy and GDP | • Increased investment into demand-side measures  
• Global convergence towards energy efficient lifestyles |
Regional baseline assessment
Regional baseline assessment of energy supply and technology mix

Primary energy

- Fossil fuels (coal, oil, and gas) are the predominant fuels until foreseeable future in the regions.
- Coal as a resource is expected to lose its importance in the mix.
- Oil is the single largest energy source of many regions in Asia.
- Renewable is far behind the expected level of use in the region.
- Except Central and South East Asia, growth of gas use is limited in the other regions.
- East Asia region is expected to get its energy peak by 2040.

Source: TA 9690 baseline results (Results are indicative and subject to change)
Regional baseline assessment of energy supply and technology mix

Electricity generation

- Fossil fuels (coal and gas) are the predominant fuels for power generation until foreseeable future in the regions.
- Coal based electricity is expected to lose its importance in the mix.
- Gas based generation is expected to be significant in many regions especially in South East Asia region.
- Renewable is far behind the expected level of share mix in the region. However, excluding hydro RE share is even dismal in many regions.
- Wind energy is expected to have a larger share in the generation mix compared to solar.
- On average renewable energy share is expected to be around 20% until 2050.

Source: TA 9690 baseline results (Results are indicative and subject to change)
Regional baseline assessment of energy supply and technology mix

Final energy consumption

- Oil remains the major source of final energy in the region which is mostly consumed by the transport sector
- Pacific region has the highest share of electricity consumption compared to all other regions
- Electricity share in overall final energy consumption is well below 20% in all major regions
- Access to electricity in the region might be limited
- Growth of transport sector and its corresponding consumption of energy has out performed all other sectoral growth and energy consumption

Source: TA 9690 baseline results (Results are indicative and subject to change)
National baseline assessment
National baseline assessment of energy supply and technology mix

Primary energy (MTOE)

Source: TA 9690 baseline results (Results are indicative and subject to change)
National baseline assessment of energy supply and technology mix

Electricity generation mix (TWh)

Source: TA 9690 baseline results (Results are indicative and subject to change)
National baseline assessment of energy supply and technology mix

Electricity generation mix (%)
Initial assessments of progress on NDC and SDG-7 in the region
NDC & SDG-7 Performance Indicators @ baseline (Clean cooking)

- Clean Cooking share (use of LPG, PNG, Elec. etc.) is increasing in all the countries in the region
- Percentage share of clean cooking widely varies among countries
- Share of clean cooking in Bangladesh and Pakistan are the lowest

Source: TA 9690 baseline results (Results are indicative and subject to change)
NDC & SDG-7 Performance Indicators @ baseline (RE Share)

- Renewable energy (solar, wind, biomass, geothermal, small hydro etc.) share to FEC is increasing for almost all countries in the region.
- Certain decrease in share indicates slower growth of RE compared to increasing energy consumption.

Source: TA 9690 baseline results (Results are indicative and subject to change)
NDC & SDG-7 Performance Indicators @ baseline (Electricity Share)

- Share of electricity in FEC is increasing rapidly in most of the countries
- Increasing share of electricity indicates cleaner consumption of energy and less emissions
- High electricity share in FEC in Bangladesh indicates less industrial activities which requires thermal energy (mostly heavy industries)

Source: TA 9690 baseline results (Results are indicative and subject to change)
NDC & SDG-7 Performance Indicators @ baseline (Energy Efficiency)

- Energy consumption per unit of GDP is decreasing for all countries.
- Energy consumption per unit of GDP is expected to grow in Bangladesh (Likely reason could be shifting from biomass to modern fuels).

Source: TA 9690 baseline results (Results are indicative and subject to change.)
NDC & SDG-7 Performance Indicators @ baseline (Access to electricity)

- Per capita electricity consumption is increasing in all countries in the region ensuring improving access to modern energy

Source: TA 9690 baseline results (Results are indicative and subject to change)
## Emissions performance in the baseline projection

### Emissions from energy use

<table>
<thead>
<tr>
<th>Country</th>
<th>2020 (MtCO₂e)</th>
<th>2030 (MtCO₂e)</th>
<th>NDC Target by 2030 (MtCO₂e)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>70</td>
<td>216</td>
<td>200</td>
<td>Easily Achievable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Target revision margin is low</td>
</tr>
<tr>
<td>China</td>
<td>12,500</td>
<td>13,400</td>
<td>15,000</td>
<td>Easily Achievable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Target revision margin is low</td>
</tr>
<tr>
<td>India</td>
<td>3,140</td>
<td>4426</td>
<td>6,000</td>
<td>Easily Achievable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Target revision margin is low</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1,470</td>
<td>2,130</td>
<td>1,750</td>
<td>Additional effort required to meet the existing target</td>
</tr>
<tr>
<td>Pakistan</td>
<td>200</td>
<td>310</td>
<td>700</td>
<td>Easily Achievable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Target revision margin is high</td>
</tr>
<tr>
<td>Vietnam</td>
<td>300</td>
<td>520</td>
<td>815</td>
<td>Easily Achievable</td>
</tr>
</tbody>
</table>

Source: NDC Targets by 2030 referred from the respective country NDC submissions, available at [https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx](https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx)

Source: TA 9690 baseline results (Results are indicative and subject to change)
Focusing on balanced approach of target achievement / Post pandemic readjustment
Region has set the ball rolling towards low carbon development. Some of the indicators are performing well towards target achievement like access to electricity and clean cooking. Renewable energy share is not increasing in the region as it was expected. It is evident that additional support is required. NDC targets in the region are often achievable and thus can be revised with higher emissions reduction. Post COVID-19 pandemic, regional economy will be very weak and thus the initial target achievement might be affected. Thus, cost base priority of mitigation actions will be important.

Demand side mitigation measure are often less expensive but less important in NDC activity list. Under current situation, countries should reconsider those activities like industrial EE and decarbonization, building energy efficiency, non-motorized transportation, use of inland water ways as suitable options. Demand side target based NDC could be low cost mitigation options for the countries. Renewable energy requires continuous policy support for its advancement. However, storage technologies could be the game changer that can fast-track the implementation of RE.
Thank you

Anindya Bhattacharya PhD
anindya.b@thecelestialearth.org

Manoj Bansal
manoj.bansal@pwc.com