

# LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

## CIVIL SOCIETY CRITICAL REFLECTIONS AND RECOMMENDATIONS





**LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY:  
Civil society critical reflections and recommendations**

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**WRITTEN BY**

Avril De Torres, *Research, Policy, and Law Program Head, CEED*  
Brent Ivan Andres, *Research Staff, CEED*

**DESIGNED BY**

Mari Jeanie Derillo, *Program Coordinator for Communications, NGO Forum on ADB*

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**CONTACTS**

All correspondences should be addressed to Unit 802, 8F, 88 Malakas Suites, 88 Malakas Street, Diliman, Quezon City, Philippines 1101. For general inquiries, e-mail us at [info@ceedphilippines.com](mailto:info@ceedphilippines.com).

For NGO Forum on ADB, correspondences should be addressed to 85-A Masikap Extension, Diliman, Quezon City, Philippines 1100. Email us at [secretariat@forum-adb.org](mailto:secretariat@forum-adb.org).

For other information, visit [www.ceedphilippines.com](http://www.ceedphilippines.com) or [www.forum-adb.org](http://www.forum-adb.org).

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## LIST OF ACRONYMS

|                 |  |
|-----------------|--|
| °C              | Degree Celsius                                   |
| AfDB            | African Development Bank                         |
| ADB             | Asian Development Bank                           |
| ADO             | Asian Development Outlook                        |
| CCOF2030        | Climate Change Operational Framework 2017-2030   |
| CCS             | Carbon Capture and Storage                       |
| CFB             | Circulating Fluidized Bed                        |
| CFPP            | Coal-Fired Power Plant                           |
| CHP             | Combined Heat and Power                          |
| CO <sub>2</sub> | Carbon Dioxide                                   |
| COP             | Conference of Parties                            |
| CPS             | Country Partnership Strategies                   |
| CRDP            | Climate-resilient Development Pathways           |
| CSP             | Concentrating Solar Power                        |
| CTL             | Coal-to-Liquids                                  |
| DMC             | Developing Member Country                        |
| EBRD            | European Bank for Reconstruction and Development |
| EIB             | European Investment Bank                         |
| EITI            | Extractive Industries Transparency Initiative    |
| FBC             | Fluidized Bed Combustion                         |
| FGD             | Flue Gas Desulfurization                         |
| GHG             | Greenhouse gases                                 |
| GST             | Global Mean Surface Temperature                  |
| HELE            | High-Efficiency, Low-Emission                    |
| IDB             | Inter-American Development Bank                  |
| IDFC            | International Development Finance Club           |
| IEA             | International Energy Agency                      |
| IED             | Independent Evaluation Department                |
| IFC             | International Finance Corporation                |
| IFI             | International Financial Institution              |
| IGCC            | Integrated Gasification Combined Cycle           |
| IPCC            | Intergovernmental Panel on Climate Change        |
| IRENA           | International Renewable Energy Agency            |
| kW              | Kilowatt   |
| kWh             | Kilowatt-hour                                    |
| MDB             | Multilateral Development Bank                    |
| MTOE            | Million tons of oil equivalent                   |
| MW              | Megawatt   |

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

|        |   |
|--------|---|
| SPD    | Strategy, Policy and Review Department                |
| SR15   | Special Report on Global Warming of 1.5 °C            |
| UNFCCC | United Nations Framework Convention on Climate Change |
| USD    | United States Dollars                                 |
| WB     | World Bank  |



## EXECUTIVE SUMMARY

**W**hen the Asian Development Bank's (ADB or the Bank) adopted its 2009 Energy Policy (or the Policy), it received varied reception among civil society organizations. On the one hand, the Bank was credited for its clean energy agenda and for heeding the strong call for a stricter prohibition on financing for coal mining projects.<sup>1</sup> On the other hand, some organizations denounced the Bank's double-talk—recognizing the threat of climate change while making exceptions for certain coal power plants for being “energy efficient” solutions to energy access and security concerns.<sup>2</sup>

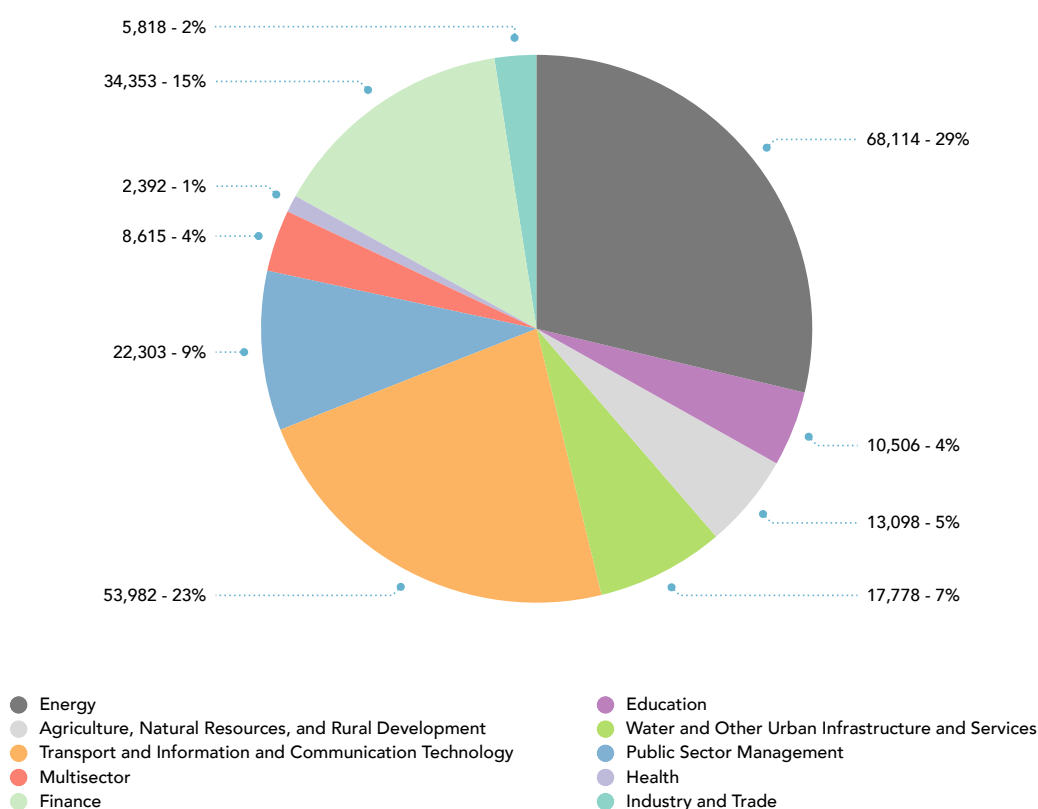
A decade since the adoption of the 2009 Energy Policy, the ADB has taken much pride in consistently meeting and even going beyond its clean energy investments target. It has also often mentioned that it has invested in few coal projects in the past and only when economically viable in addressing chronic power blackouts that disproportionately affect the poorest people.

However, in determining whether the Bank has truly translated its clean energy agenda into actual commitments, meeting clean energy investment targets should not be the only measure. Reviewing the Bank's energy lending portfolio reveals three things: (1) the Bank still has a carbon-intensive energy lending portfolio; (2) the Policy is severely outdated in the context of the global energy transformation and the climate emergency; and (3) the Bank has to decarbonize now in order to become the much-needed financial leader of the energy transformation in Developing Asia.

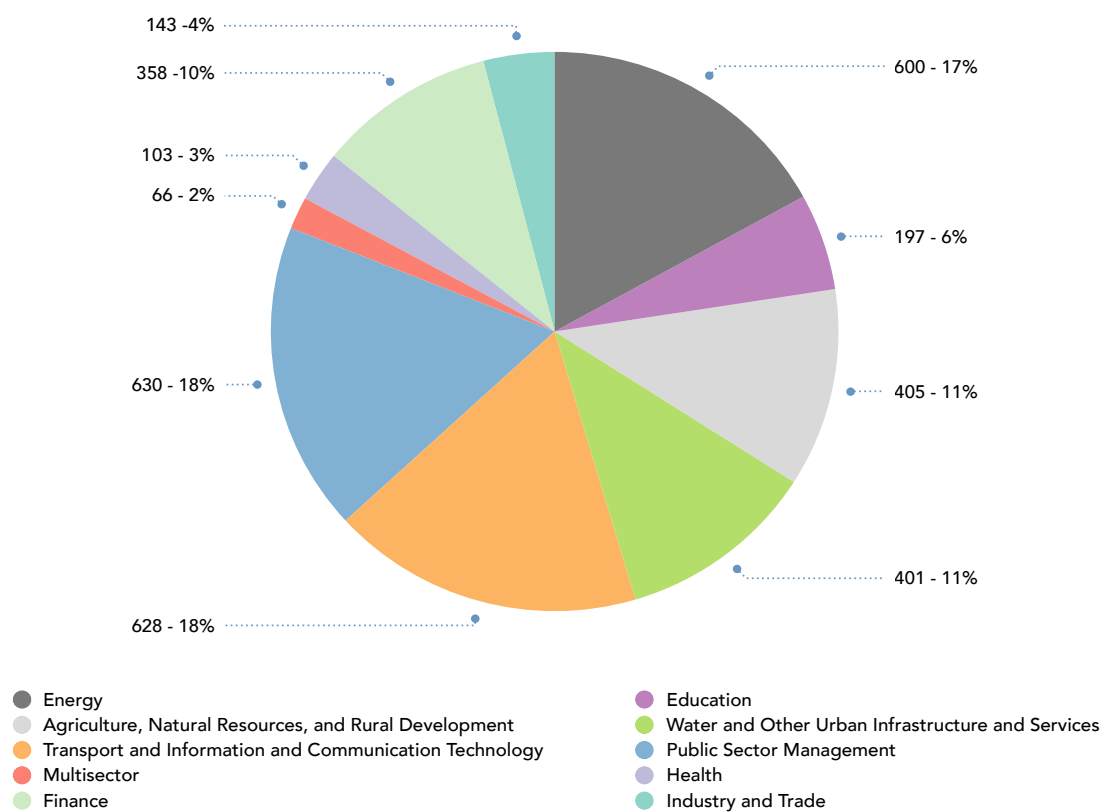
### CARBON-INTENSIVE ENERGY PORTFOLIO

Under its 2009 Energy Policy, ADB has been financing high-carbon development projects and strategies. The Energy Sector is its top investment sector in terms of committed resources (approximately USD 68,114 million), and third in terms of number of funded projects (600 projects). Out of all the energy generation projects, only 19% are fossil fuel projects. However, when measured in terms of installed capacity, fossil fuels actually comprise 50% of total installed capacity of all ADB-funded energy generation projects in the past decade.<sup>3</sup>

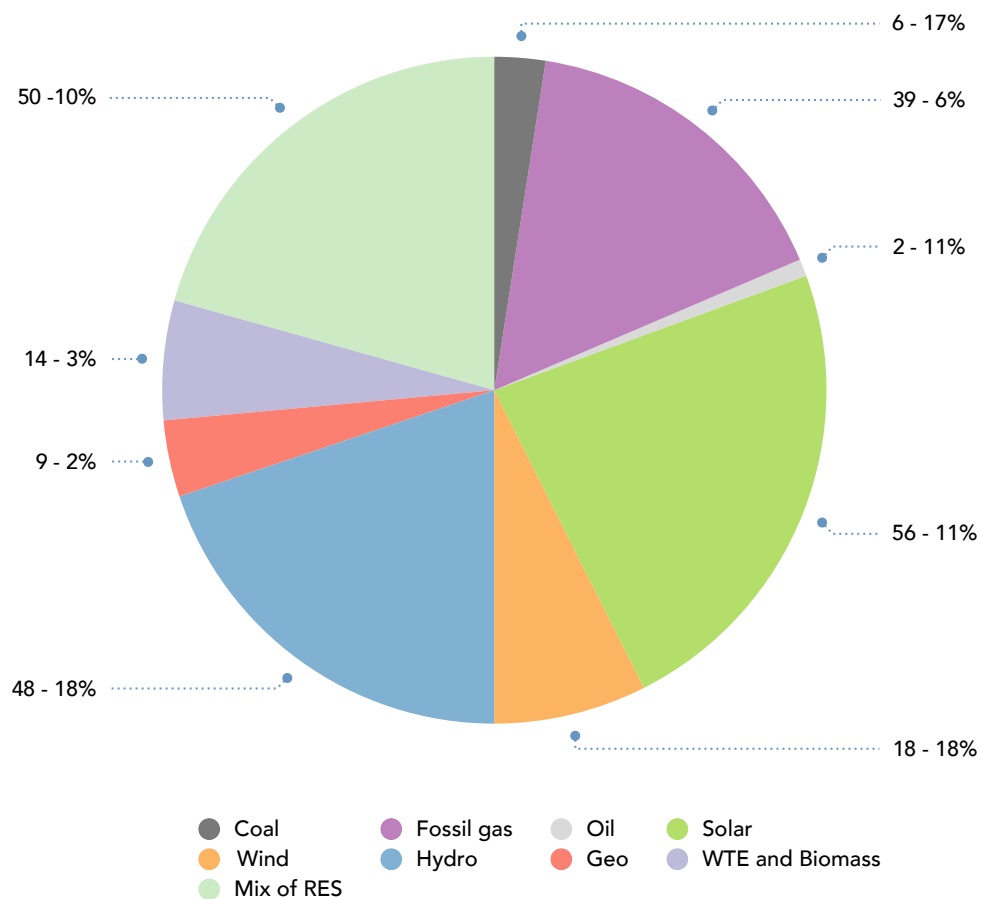
**Commitments by sectors (in million USD) (2009-2018)**



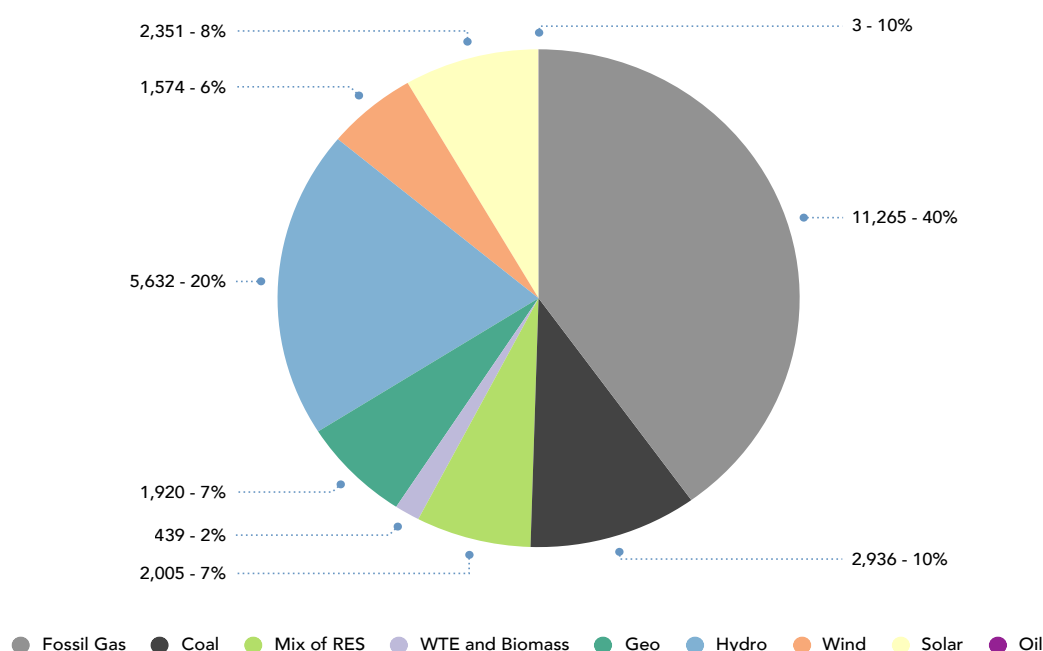
### Funded projects by sector (2009-2018)



### Energy projects by source (2009-2018)



Energy projects by total installed capacity (2009-2018)



## 2009 ENERGY POLICY AND RECENT DEVELOPMENTS

ADB's carbon-intensive energy portfolio is rooted on the fact that its "clean" energy agenda is a grave misnomer. Although climate change is considered as a key issue in the Policy, the Bank itself admits that *not* all of its clean energy investments are considered climate investments. Without a strict criteria for "clean" energy and a firm exclusion for financing of coal projects, the 2009 Energy Policy has enabled the Bank to make dirty commitments, providing crutch for the next generation of advanced coal plants.

Among the many justifications for carbon-intensive projects under the Policy are:

- ⊙ **Energy efficiency**, which includes improvements in fossil fuel-based power plants such as Circulating Fluidized Bed (CFB), flue gas desulfurization (FGD), Integrated Gasification Combined Cycle (IGCC), High-Efficiency, Low-Emission (HELE) or Supercritical and Ultra-supercritical Technology, Coal-to-Liquid (CTL), and Combined Heat and Power (CHP).<sup>4</sup>
- ⊙ **The need for reliable and affordable energy**, which is supposedly supplied by coal power plants at least cost for baseload demand.<sup>5</sup>
- ⊙ **Commercialization of the coal sector** to ensure that coal plants have enough supply of coal for captive use.<sup>6</sup>
- ⊙ **Funding marginal and already proven oil fields** should the fields turn out to be commercial eventually.<sup>7</sup>
- ⊙ **Maximizing access to energy for all** as an all-encompassing justification for financing fossil fuels.<sup>8</sup>

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

Despite its carbon-intensive energy lending portfolio, ADB has endeavored to position itself as a climate leader among international financial institutions (IFIs) by making pronouncements and commitments on climate financing. Some of its notable climate pronouncements are:

- ⊙ 2011 – Joint MDB Approach for Climate Mitigation and Adaptation Finance Reporting, which still included energy-efficiency improvements and retrofitting of fossil fuel power plants as climate mitigation activities;
- ⊙ June-July 2015 – MDB and IDFC Common Principles for Climate Change Mitigation and Adaptation Finance Tracking, which retained a lenient list of mitigation activities;
- ⊙ November 2015 – Framework for a Harmonized Approach to GHG accounting, where ADB set bottom range shadow carbon prices compared to other MDBs;
- ⊙ December 2015 – Climate Action in Financial Institutions Initiative, which aimed to mainstream climate action among MDBs instead of mere investment targets;
- ⊙ September 2016 – Asian Development Outlook 2016 Update, where immediately after its remarkable climate initiative launch, ADB derogated from the 1.5°C goal;
- ⊙ March 2017 – Integrating a shadow carbon pricing through its updated Guidelines for the Economic Analysis of Projects;
- ⊙ July 2017 – Climate Change Operational Framework 2017-2030, which fails to integrate an urgent review of the 2009 Energy Policy;
- ⊙ July 2018 – ADB Strategy 2030, which lacks any strategy on terminating active fossil fuel investments and cancelling proposed fossil fuel investments; and
- ⊙ December 2018 – MDB's Alignment Approach to the Paris Agreement, which includes a commitment to align internal policies to the Paris Agreement.

## THE IMPERATIVE TO DECARBONIZE

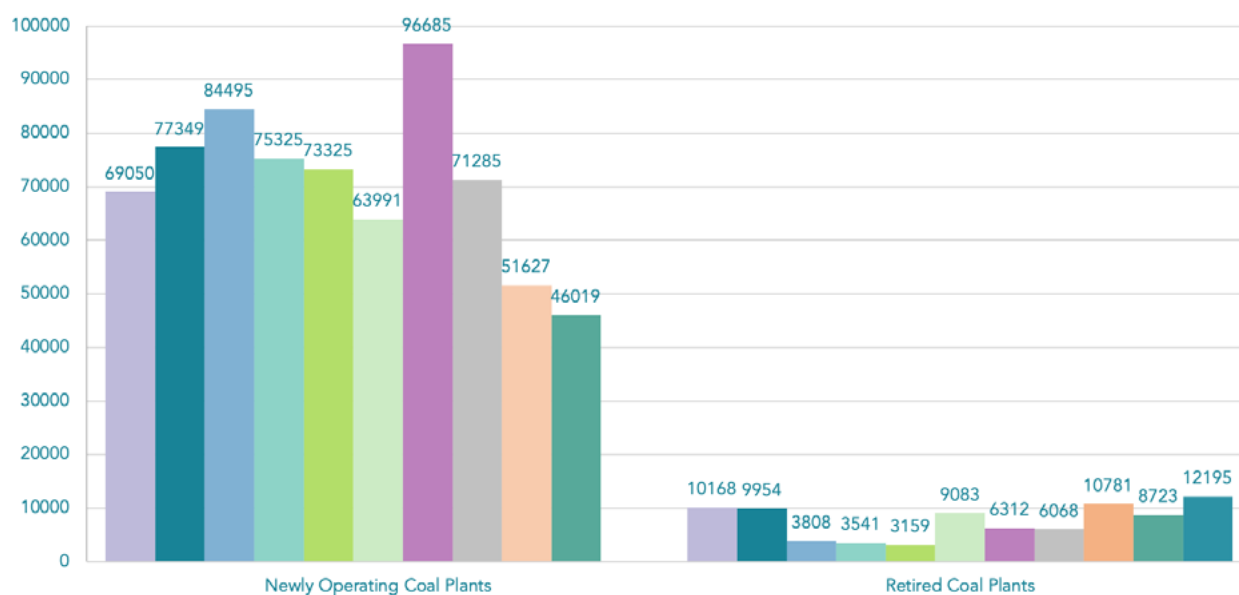
Time and again, ADB would emphasize that even though it does not exclude financing for all coal projects in its Energy Policy, it has been years since it last funded a coal power plant. However, in last year's Asian Clean Energy Forum, then-ADB President Takehiko Nakao expressed doubts on whether the Bank will “totally dismiss the possibility of coal projects because in some countries there's no access to other options”.<sup>9</sup> This confirmed well-justified concerns that without a clear policy on paper that excludes financing for coal power projects, the Bank will always be open to funding coal projects.

Today's energy landscape, the ongoing climate emergency forewarned by the IPCC, deteriorating air quality, progressive new energy policies from other financial institutions, and new viable renewable energy alternatives warrant the urgent updating of the Bank's energy policy.

Since 2009, there has been drastic coal expansion in Developing Asia. Meanwhile, the rest of the world has experienced a wave of retirement of existing coal projects and cancellation of proposed and pipeline coal projects.<sup>10</sup>

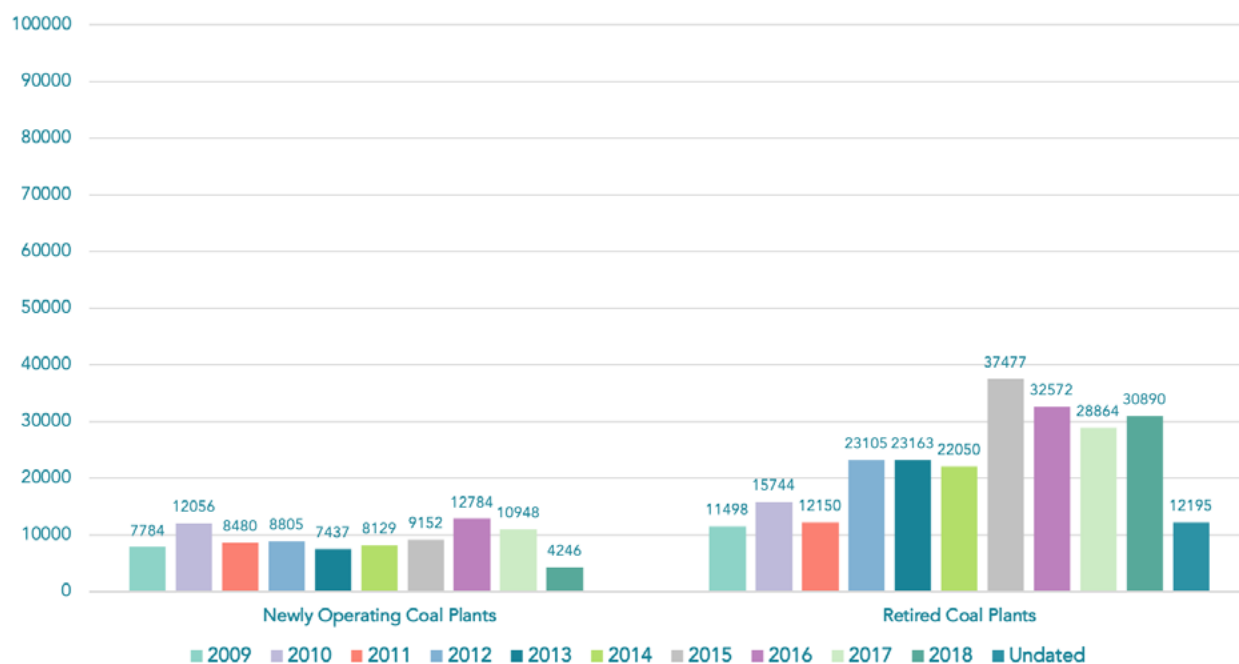
Moreover, coal power is increasingly a high-cost option due to: rising operating costs, rising fuel costs, and stranded assets. On the contrary, renewable power technologies are increasingly becoming cost-competitive after years of steady cost decline. Majority of utility-scale renewable power generation technologies experienced a remarkable decline in global LCOE, except for geothermal and hydro technologies.<sup>11</sup>

### Newly Operating and Retired Coal Plants in Developing Asia, 2009-2018



Source: CoalSwarm Global Coal Plant Tracker, January 2019

### Newly Operating and Retired Coal Plants in the Rest of the World, 2009-2018 and undated



Source: CoalSwarm Global Coal Plant Tracker, January 2019

The IPCC also forewarns us of the 10-year climate race—to keep global warming at not more than 1.5°C by the end of the century and to avoid adverse climate impacts, we only have less than 10 years to slash global net anthropogenic CO<sub>2</sub> emissions by about 45% from 2010 levels, and 30 years to reach net zero CO<sub>2</sub> emissions.<sup>12</sup>

EIB's new ambitious energy lending policy proves that phasing out fossil fuels and other carbon-intensive projects is not only imperative but possible today. As other financial institutions continue to

exit coal and wean off false solutions, ADB should make the critical decision regarding its role in this global energy transformation—whether it will leave the door open for financing for coal and other fossil fuel projects or it will finally phase out financing for coal and other fossil fuels. If it chooses the latter, then it will play the catalytic role of leading the financing for Developing Asia's energy transformation.<sup>13</sup>

## ADB'S CATALYTIC ROLE IN ASIA'S ENERGY TRANSFORMATION

The ADB should consider the following in its new energy policy.

### 1 | Paris alignment with a 1.5°C goal:

- ⊙ Adopt a Paris-aligned policy, instead of merely setting a clean energy or climate agenda.
- ⊙ A Paris-aligned policy should pursue and promote a 1.5°C Pathway—reaching a global CO<sub>2</sub> emissions decline of 45% from 2010 levels by 2030, and a net-zero CO<sub>2</sub> emissions by mid-century—without false solutions.
- ⊙ Country partnership strategies (CPS) should also be updated to ensure alignment with the Paris Agreement, and projects should be screened in accordance with CPS and national decarbonization pathways.
- ⊙ Identify NDC-related opportunities for private actors.
- ⊙ Use and report more systematically on the impacts of its climate finance.

### 2 | Decarbonize energy supply:

- ⊙ Declare a full commitment to divest from all coal mining and power projects and other coal infrastructures—including but not limited to (i) coal mined for captive use of a power plant, (ii) projects considered energy efficient, adopting a carbon capture storage, other mitigating measures, and (iii) projects using co/tri-generation technology.
- ⊙ Systematically account for GHG emissions on a project-level towards screening other carbon-intensive projects through a stringent emission performance standard for all power generation and CHP projects.
- ⊙ Emission performance standards should be applied to all power projects, including renewable energy projects.
- ⊙ Impose a shadow carbon price of at least USD 80/tCO<sub>2</sub> by 2020 and USD 100/tCO<sub>2</sub> by 2030, coupled with a faster and higher rate of increase.
- ⊙ Set out strict exclusion criteria for fossil gas projects if determined to be a necessary and economically viable bridge fuel for a DMC's low-carbon transition.
- ⊙ For existing coal projects and other carbon-intensive projects, a clear commitment must be made towards a rapid phase-out starting with the adoption of an ambitious transition plan.
- ⊙ ADB should provide DMCs' technical assistance to help DMCs strengthen institutional capacities to formulate just transition policies and strategies, especially in the face of a pandemic.

### 3 | Promote community microgrids

- ⦿ Community microgrids should be prioritized since they maximize energy access and are increasingly cost-competitive and bankable.
- ⦿ As the costs of solar and wind technologies have decreased exponentially and have become competitive with fossil fuel technologies, ADB should be looking into community microgrids as attractive investments that are aligned with meeting DMCs' commitments to the Paris Agreement.

### 4 | Support innovations, and enabling infrastructures

- ⦿ Support funding for innovative renewable energy technologies.
- ⦿ Prioritize upgrading of existing grids into smart grids with increased capacity, in order to maximize the integration of more variable renewable energy.
- ⦿ Support other energy infrastructures such as gas and district heating and cooling networks for low-carbon gases.



# INTRODUCTION

Over the past year, this paper has been cited in several engagements with the ADB with the overall objective of providing concrete recommendations towards the decarbonization of the Bank's energy lending portfolio. The initial findings were first presented in ADB's 52<sup>nd</sup> Annual Meeting in Fiji during the Civil Society Panel Discussion entitled "Impact of ADB's Energy Policy and the Paris Agreement on Climate Change".

In separate closed door meetings with ADB Chief of Energy Sector Group Dr. Yongping Zhai and ADB Independent Evaluation Department (IED) Director General Marvin Taylor-Dormond, members of the NGO Forum on the ADB (Forum) and the Center for Energy, Ecology, and Development (CEED) had more candid discussions on the initial findings of the paper, including the long-standing policy changes that civil society has lobbied for in the past decade and their feasibility today. Most recently, the Forum and CEED echoed key points and recommendations of the paper during the Civil Society-ADB Dialogue in the Asian Clean Energy Forum 2020 with Dr. Zhai.

A week before the ADB's 53<sup>rd</sup> Annual Meeting (Second Stage), we are delighted to finally share the full paper published by the Forum. Commissioned by the Forum, this paper reviews how the 2009 Energy Policy has justified the Bank's carbon-intensive energy lending portfolio for the past decade, despite later climate or clean energy pronouncements made by the Bank. Under the Policy, the Bank was able to fund renewable energy projects without displacing funding for coal and other fossil fuels. And this is the true legacy of the ADB—contributing to opening the gateway for new coal technologies in the region. Today, Asia is in fact being cited as a prime example to advance "clean coal" technologies in other countries like the U.S. and Australia.

Alongside the IED's Sector-wide Evaluation of the ADB Energy Policy and Program, 2009-2019 and in time for the ADB's review of its 2009 Energy Policy, we hope this paper provides the Bank a comprehensive picture of the role that it has played in the region's energy sector. Similar to the IED's Evaluation Paper, this paper likewise presents an evaluation of the same Policy and energy lending portfolio for the past decade, however this time from the critical perspective of civil society.

We commend the IED for recommending a formal withdrawal of financing on all new added capacity of coal-fired power and heat generation plants

while helping DMCs to phase-out coal-based energy together with several other strong recommendations against fossil fuels. However, we notice its silence on the urgent need to align with the 1.5°C Paris temperature goal and establish just transition programs for affected workers. The risk of facing poverty traps are real issues for workers, especially amidst the pandemic, and should not be overlooked.

We emphasize these recommendations alongside several others on promoting community microgrids, innovations, and enabling infrastructures for renewable energy. We hope this paper urges the Bank to, firstly, take accountability for its contributions to coal and fossil fuel expansion in the region in the past decade; and secondly, to take a decisive turnaround this decade. The Bank can play a catalytic role in Developing Asia's energy transformation by closing its doors to coal and other fossil fuels once and for all in this critical decade of the climate race.

We hope to continue engaging the Bank towards the finalization of a 1.5°C-aligned Energy Policy that meets the converging interests of energy security, affordability, poverty alleviation, local air quality improvement, and the climate race set before us.

**Gerard Arances**

*Executive Director*

Center for Energy, Ecology, and Development

**Rayyan Hassan**

*Executive Director*

NGO Forum on ADB

## METHODOLOGY, SCOPE, AND LIMITATIONS

**T**his paper comes at an opportune time—just weeks after the IED published its Sector-wide Evaluation of the ADB Energy Policy and Program, 2009-2019 and a week before the ADB's 53<sup>rd</sup> Annual Meeting (Second Stage). This paper aligns its evaluation of the Policy in light of the five important factors enumerated in IED's Evaluation Approach Paper, to provide a critical perspective from civil society: (1) the ongoing global energy transformation, (2) rising climate change concerns, and (3) deteriorating air quality. Moreover, two additional factors will be considered: (4) the extent other multilateral development banks (MDBs) support coal for power generation or other applications, and (5) the varying energy choices among different DMCs—small island developing states, fragile states, land-lock states, and resource-rich countries.<sup>14</sup>

The 2009 Energy Policy and its implementation is first reviewed through its energy lending portfolio in the past decade, to assess how its new clean energy agenda has translated into commitments. For sector-wide trends and key insights, data from ADB's energy project profiles and annual reports from 2009-2018 were used.

A separate dataset of the Bank's energy lending portfolio starting from the adoption of the Policy on June 2009 until December 2018 was created. For Sovereign Projects, data was culled from ADB's Data on Sovereign Projects 2005 onwards as of 18 January 2019 available in ADB's Data Library<sup>15</sup>. This dataset was cross-referenced with the data available in ADB's Projects & Tenders tab in its website.<sup>16</sup> Non-sovereign projects were also included from data available in ADB's Projects & Tenders tab. Searches in the ADB's Projects & Tenders tab were filtered to the energy sector and the years 2009-2018. In some instances, specific energy projects did not appear when searches were filtered in this manner. These energy projects were deliberately searched in the tab and added to the dataset in those cases.

In recognition of the fact that fossil fuel power plant projects more often have larger capacities than renewable energy power plant projects, and that greenhouse gas and other harmful emissions are not measured in terms of number of projects but in terms of the energy source and the capacity of the project, a separate dataset was also created for energy generation projects. A project is considered as an energy generation project if it installs new or additional power generation capacity and mentions the specific capacity in the project data sheet or project documents available. This is regardless of whether the project is categorized under the subsectors conventional, renewable energy, and large hydropower energy generation.

Using these datasets, an assessment of ADB's Energy Lending Portfolio was conducted in terms of committed resources (in Millions USD), number of projects funded, energy sources utilized (fossil fuels or renewable energy), and capacity (in MW).

The paper proceeds to review the 2009 Energy Policy and succeeding key pronouncements and commitments on energy and climate to surface enabling provisions or loopholes that allowed for a carbon-intensive energy lending portfolio. The case for the imperative to decarbonize the ADB is discussed based on the five important factors mentioned in the IED approach paper.

The paper ends by providing concrete recommendations towards decarbonizing the energy lending portfolio of the ADB, with specific emphasis on Paris alignment with a **1.5°C goal, rapid and just** transition, and enabling infrastructures for new renewables technologies and for distributed, renewable energy systems.

Although the paper looks into the Bank's pronouncements, commitments, and framework on climate finance, the evaluation of the lending portfolio and the recommendations are limited to the energy sector. Further, the recommendations are intentionally limited to the decarbonization of the Bank's energy lending portfolio, although it is recognized that there are other important considerations, as well.

In order to establish that distributed, renewable energy systems are now bankable, the paper concludes by providing the case for distributed, renewable energy systems in the Philippines by aggregating the total power demand for unelectrified households and various available methods to provide financing to these projects.

Throughout the paper, various case studies are also cited to provide concrete examples of ADB-funded energy projects under the 2009 Energy Policy.



## 1 | ADB'S CARBON-INTENSIVE ENERGY PORTFOLIO

**O**n June 2009, ADB adopted a new energy policy, which received varied reception among civil society organizations. On the one hand, the Bank was credited for its clean energy agenda anchored on the recognition of climate change as a real and increasing threat.<sup>17</sup>

The Bank was also lauded for heeding the strong call for a stricter prohibition on financing for coal projects after receiving heavy criticism from the NGO Forum on the ADB. Initially, the draft policy had a glaring loophole that would essentially allow the Bank to finance a wide range of coal extraction projects. The Bank later adopted a stringent policy that prohibits financing for all coal extraction projects except for *captive use* by thermal power plants.

On the other hand, some organizations denounced the Bank's double-talk—recognizing the threat of climate change while making exceptions for certain coal power plants for being “energy efficient” solutions to energy access and security concerns.

A decade since the adoption of the 2009 Energy Policy, the ADB has taken much pride in consistently meeting and even going beyond its clean energy investments target;<sup>18</sup> and in investing in few coal projects in the past and only when economically viable in addressing chronic power blackouts that disproportionately affects the poorest people.<sup>19</sup>

However, in determining whether the Bank has truly translated its clean energy agenda into actual commitments, meeting clean energy investment targets should not be the only measure. There should be a comprehensive review of the entire energy lending portfolio vis-à-vis clean energy projects, in terms of number of projects, committed resources, and for electricity generation projects, in terms of total capacity.

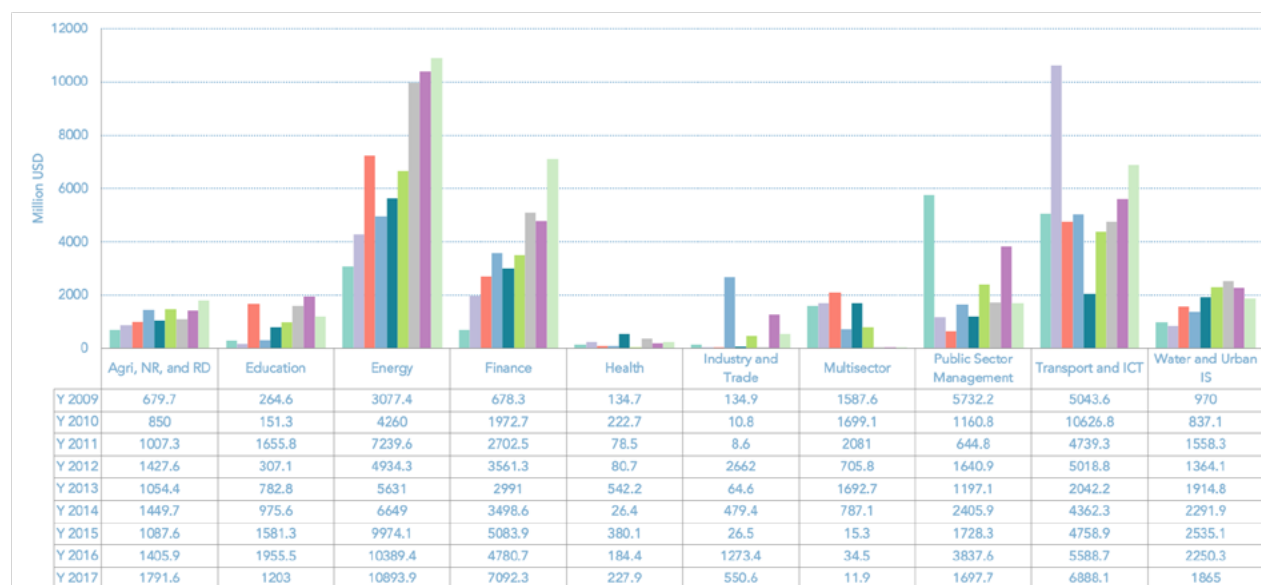
A survey of ADB's energy portfolio from 2009<sup>20</sup> until 2018<sup>21</sup> reveals that specific to electricity generation, ADB's total “clean” energy investments<sup>22</sup> still almost equals its fossil fuels investments in terms of committed resources<sup>23</sup> and total capacity<sup>24</sup>.

## ENERGY AS A TOP INVESTMENT SECTOR

The Bank's investments are categorized into ten sectors, one of which is the Energy Sector. From 2009 to 2017, data shows that ADB has invested consistently and primarily in the Energy Sector, both in terms of committed resources and number of projects.

Except for the years 2009, 2010, and 2012, ADB has committed the most resources in the Energy Sector every year, in the past nine years, compared to any sector (Figure 1).

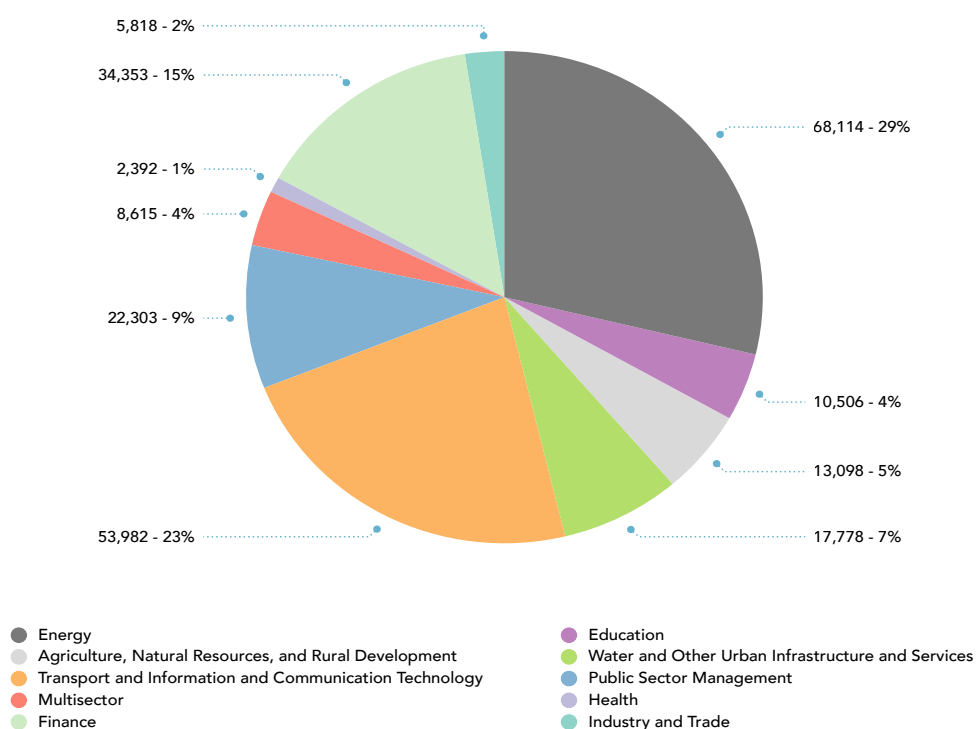
**Figure 1**  
**COMMITTED RESOURCES BY SECTOR TREND (IN MILLIONS USD), 2009-2018<sup>25</sup>**



*Source: ADB's Annual Reports.*

When totalled, the Energy Sector still comes as a top investment sector with the largest committed resources for the past decade, amounting to USD 68,114 Million (Figure 2). This amounts to 29% of all committed resources in the past nine years. This is followed by the Transport and Information and Communication Technology Sector, with over USD 49,068 Million worth of investments.

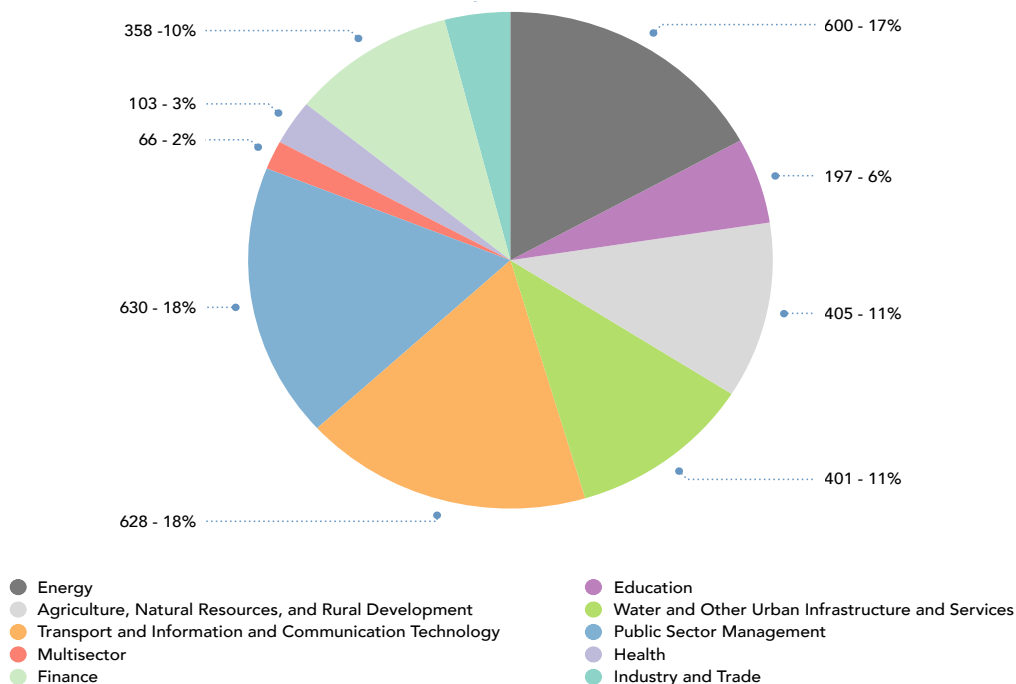
**Figure 2**  
**COMMITMENTS BY SECTOR (IN MILLION USD), 2009-2018**



Source: ADB's Annual Reports.

In terms of number of funded projects by sector, the Energy Sector has the third most number of funded projects, next only to Public Sector Management and Transport and Information and Communication Technology Sector (Figure 3).

**Figure 3**  
**FUNDED PROJECTS BY SECTOR, 2009-2018<sup>26</sup>**



Source: ADB, Projects, <<https://www.adb.org/projects>>.



## CARBON-INTENSIVE ENERGY INVESTMENTS

## DEFINING CARBON-INTENSIVE PROJECTS

The term “carbon” scientifically refers to a chemical element identified in the periodic table like hydrogen and oxygen. However, in the context of climate change, the term carbon has been used as shorthand for Carbon Dioxide (CO<sub>2</sub>).

According to the Intergovernmental Panel on Climate Change (IPCC), the drastic increase in anthropogenic greenhouse gas (GHG) emissions—mainly CO<sub>2</sub>, and including methane and nitrous oxide—since the pre-industrial era have extremely likely caused climate change. Moreover, the IPCC’s Fifth Assessment Report (5AR) finds that in terms of global anthropogenic CO<sub>2</sub> emissions, the burning of fossil fuels<sup>27</sup> is still the biggest contributor to CO<sub>2</sub> emissions to date.<sup>28</sup>

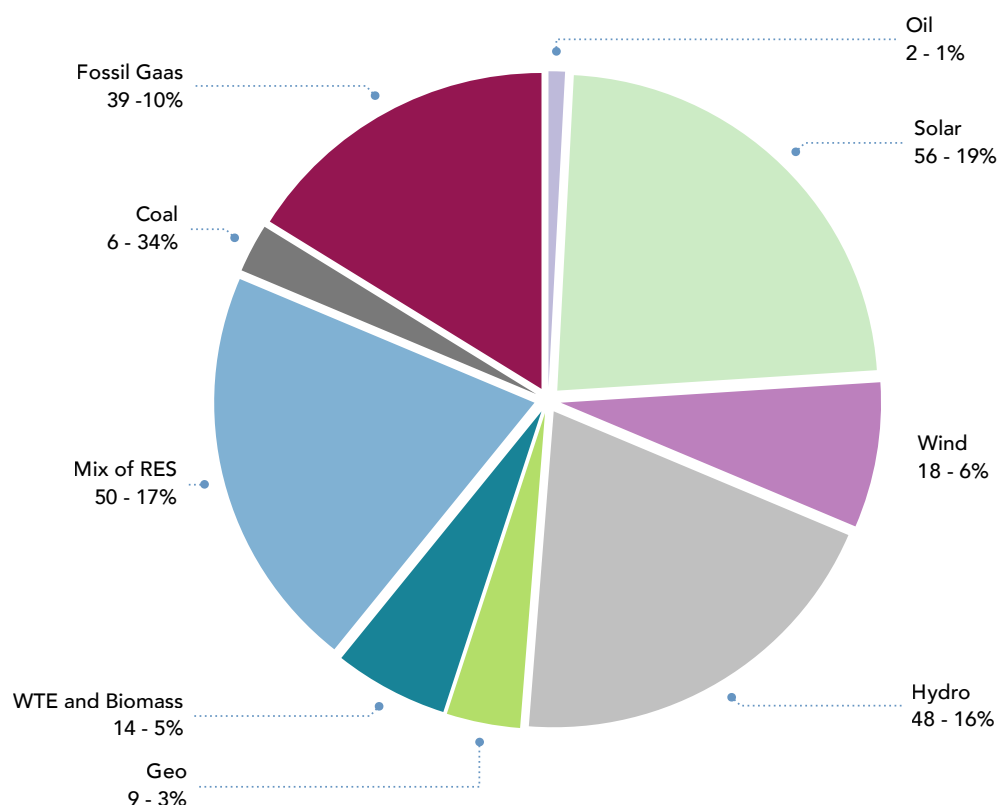
Proposed mitigation options include the decarbonization—or the reduction of the carbon intensity—of the global energy supply, specifically referring to fossil fuels as the carbon-intensive energy resources.<sup>29</sup> Thus, as used in this paper, carbon-intensive projects refer to all projects which consume fossil fuels as an energy supply.

In some instances, other carbon emitting projects will also be highlighted since they may be considered as GHG-intensive depending on the specifics of the project. There is a growing body of work that have found conventional large-scale renewable energy technologies such as hydropower dams and geothermal plants often thought as carbon-neutral, as actually emitting carbon and other GHGs. Although hydropower and geothermal emit significantly lower amounts of carbon compared to fossil fuels, they also emit methane which is 34 more times potent than other GHGs.<sup>30</sup> Further, since the goal under the Paris Agreement is a net-zero carbon society, it is important to consider the Bank’s policy on other carbon and GHG emitting power projects.

Finally, given this definition for carbon-intensive and carbon-emitting projects, it should be noted that some projects considered by the Bank as clean energy projects, such as natural gas infrastructure and efficiency improvements in fossil energy power plants, are counted as carbon-intensive projects in this paper.

In a survey of all of ADB’s energy generation projects—projects that install new or additional power generation capacity regardless of whether it is categorized under the subsectors conventional, renewable energy, and large hydropower energy generation—from 2009-2018, funded fossil fuel projects only amount to 19% of total funded projects (Figure 4). The Bank has in fact significantly invested in more renewable energy projects compared to fossil fuel projects in the past decade.

**Figure 4**  
**ENERGY GENERATION PROJECTS BY SOURCE, 2009-2018<sup>31</sup>**



Source: ADB, Projects, <<https://www.adb.org/projects>>.

Figures 5 to 7 reviews energy generation projects in terms of *total capacity*. In assessing generation capacities, it should be considered that mature conventional generation technologies for fossil fuels have a higher power density compared to new renewable energy technologies. A coal plant, for instance, can produce more electricity in one square meter of infrastructure compared to a solar farm. Thus, fossil fuels, by nature of their technology, can be built with larger capacities.

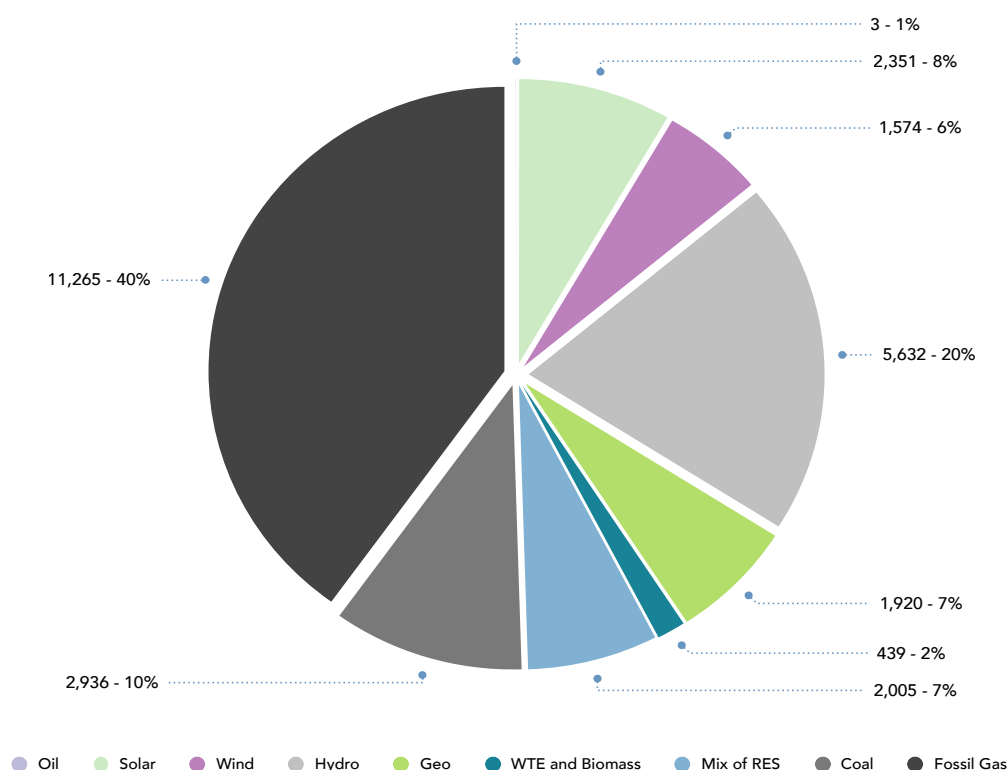
However, it is important to consider energy generation projects not only in terms of *number of projects* and *energy source* but also in terms of *total capacity* since the scale of the energy demand served, social and environmental impacts, and GHG emissions also depend on the capacity of the project.

If the Bank indeed wants to catalytic role in advancing the clean energy agenda in Asia and the Pacific, it should drastically increase renewable energy generating capacity compared to fossil fuels in the region. However, data show that the Bank has failed to do so.

Fossil fuel projects still account for 50% of total funded energy generation projects in terms of installed capacity (Figure 5). Despite having funded four times more renewable energy projects (195 project) than fossil fuel projects (47 projects), the total capacity of the fossil fuel projects still almost equals the total capacity of all renewable energy projects.

It has invested in 39 fossil gas energy generation projects only but the total installed capacity of these projects equals to 41% of the installed capacity of all its energy generation projects at 11.265 GW.

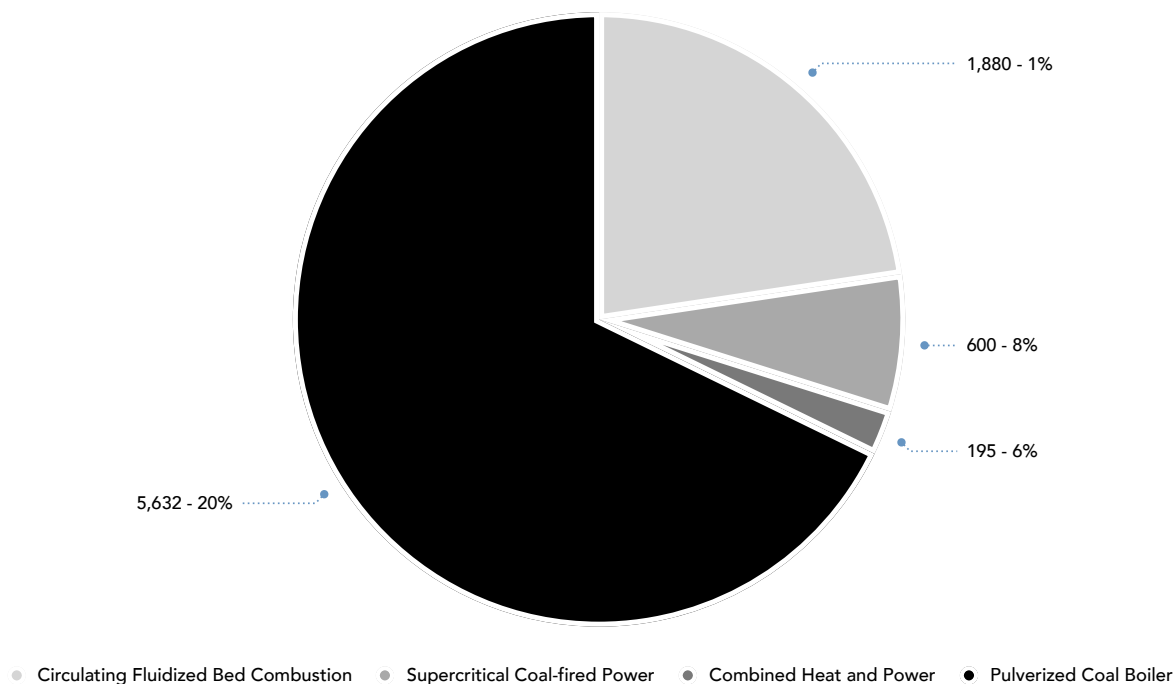
**Figure 5.**  
**ENERGY GENERATION PROJECTS BY TOTAL INSTALLED CAPACITY (IN MW), 2009-2018**



Source: ADB, Projects, <<https://www.adb.org/projects>>.

Coal generation projects have the second largest share in the ADB's mix at 9% or almost 3 GW even though the Bank has invested in only 6 coal power projects in the past decade. Over 2 GW of installed capacity comes from pulverized coal boiler and circulating fluidized bed combustion, while the rest comes from supercritical coal-fired power and combined heat and power technologies (Figure 6).

**Figure 6**  
**COAL GENERATION PROJECTS BY TOTAL INSTALLED CAPACITY (IN MW), 2009-2018**



## PROMOTING THE MYTH OF “CLEAN COAL” IN MONGOLIA<sup>32</sup>

In 2014, ADB accepted its hopefully last coal project—the highly contested Coal to Cleaner Fuel Conversion Heating in Ger District and Power Generation in Mongolia. To be clear, “cleaner” fuel refers to gas fuel and high-quality petroleum products produced through a coal-to-liquid (CTL) technology.

This CTL project intends to capitalize on abundant domestic coal resources for heating and power generation while supposedly *drastically* reducing air pollution and dependence on imports of petroleum products.<sup>33</sup> ADB provided Policy and Advisory Technical Assistance and financing amounting to USD 0.35 Million.<sup>34</sup> This was in line with the Bank’s Interim Country Partnership Strategy 2014-2016 for Mongolia.<sup>35</sup>

ADB accepted this project despite recognition that Mongolia already has a fossil fuel-based economy, which has brought about major challenges in energy security, air pollution, and climate change.<sup>36</sup>

### ***Strong opposition by communities and organizations***

The CTL project was heavily contested by communities, civil society organizations (CSOs), peoples’ organizations, and other organizations not only in Mongolia but across Asia.<sup>37</sup> Even when gasified then liquefied, the by-product of coal remains a dirty fossil fuel that emits carbon dioxide (CO<sub>2</sub>) at levels much higher than renewable energy, the groups argued.

In fact, as early as 2008, there was already a study stating that carbon dioxide (CO<sub>2</sub>) emissions in CTL technology, which uses the same process used in ADB-funded and -assisted CTL project in Mongolia, are 1.8 times more than petroleum. This is due to the energy used in the conversion process and the carbon content of the coal feedstock.<sup>38</sup>

### ***A gateway to more “clean coal”***

In 2014, renewable heating was already dubbed as renewable energy’s next frontier,<sup>39</sup> with DMCs such as Thailand already including renewable heating targets in their Energy Development Plan by 2036.<sup>40</sup> Instead of supporting innovations and creating an enabling environment for private investment in renewable energy heating in DMCs like Mongolia, the Bank intended and in fact succeeded in cultivating an enabling environment for CTL.<sup>41</sup>

It supported Mongolia in reforming its regulatory framework to attract private investment, leading to a successful large scale public–private partnership project in the country’s energy sector<sup>42</sup>—referring to the controversial Combined Heat and Power Plant Number 5 (CHP5)<sup>43</sup>. It also indicated as a Performance Target and Indicator the implementation of a large-scale CTL project by 2025.<sup>44</sup> Finally, it recommended new laws and regulations to remove barriers and encourage more investments in this field.<sup>45</sup>

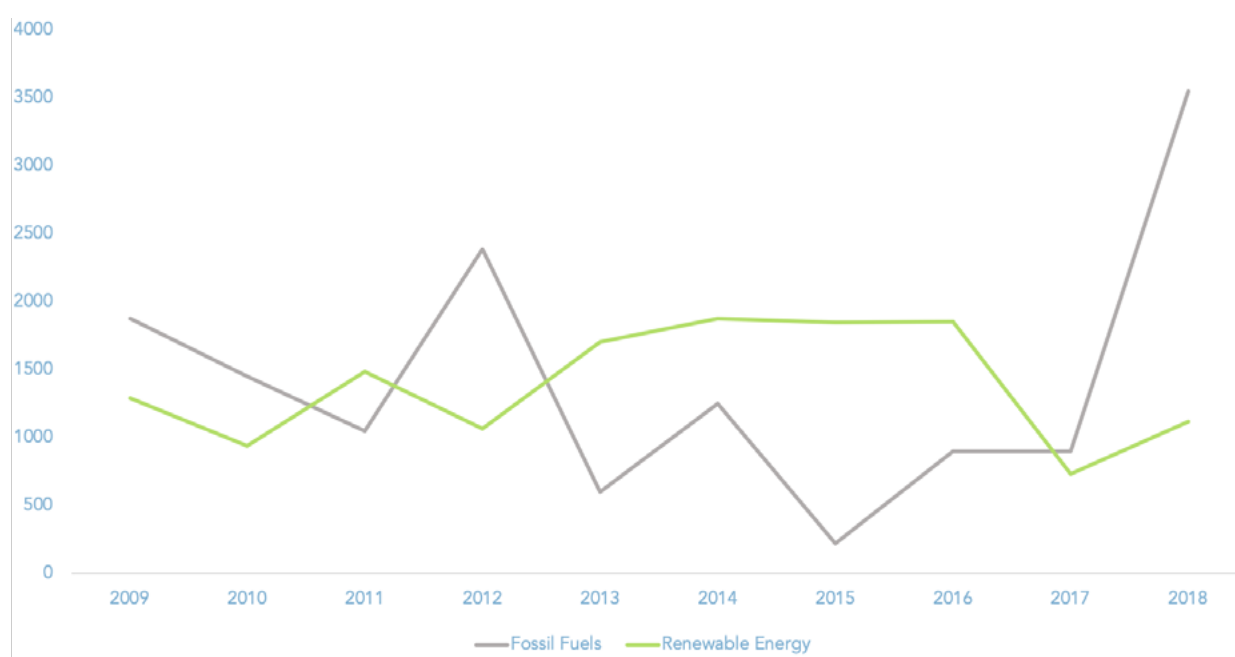
## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

It is also important to note that out of 195 renewable energy generation projects, 57 projects or almost a third of total projects pertain to hydropower and geothermal. These projects total 27% of the installed capacity of energy generation projects. For hydropower projects, over 97% of the total hydropower capacity comes from large-scale projects with more than 100MW installed

capacity. Among these projects are those that have been heavily opposed for harmful environmental and social impacts such as the 290MW Nam Ngiep 1 Hydropower Project in Lao PDR, Upper Trishuli 1 Hydroelectric Power Project (No. 49086-001) and the Nenskra Hydropower Project (No. 49223-001).

## CLEAN AGENDA, DIRTY COMMITMENTS

**Figure 7.**  
**ENERGY GENERATION PROJECTS**  
**BY TOTAL INSTALLED CAPACITY TREND (IN MW), 2009-2018**

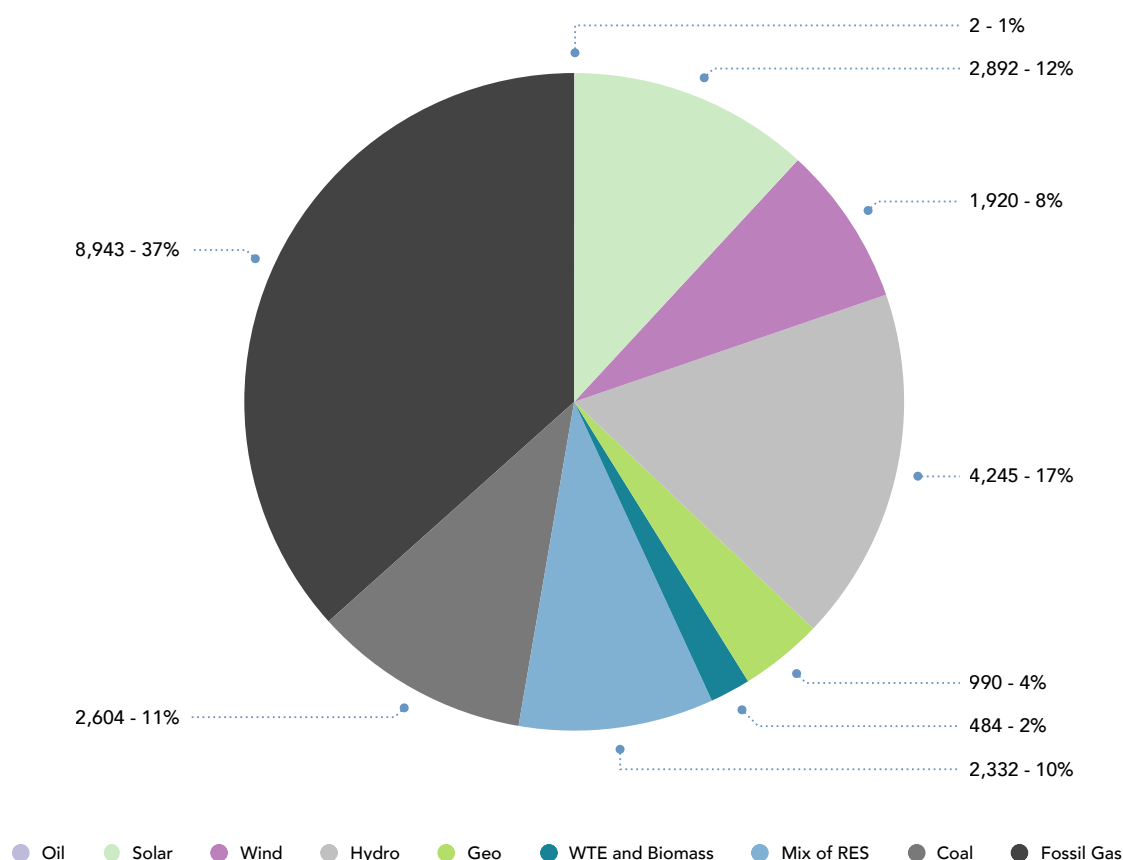


Source: ADB, *Projects*, <<https://www.adb.org/projects>>.

When total installed capacity trend is viewed in terms of fossil fuels vis-à-vis renewable energy, it shows that the ADB has not scaled up efforts in increasing renewable energy capacity in the region towards the end of the decade. In fulfilling its clean energy agenda, the Bank has set investment targets that have not overtaken its

investments in fossil fuel projects. In fact, fossil fuel investments have consistently increased since 2015, much larger than renewable energy projects in scale—from 225MW in 2015, 900MW in 2016 and 2017, and 3550MW in 2018 (Figure 8).

**Figure 8.**  
**COMMITTED RESOURCES FOR ENERGY GENERATION PROJECTS**  
**(IN MILLION USD) BY SOURCE, 2009-2018**



Source: ADB, *Projects*, <<https://www.adb.org/projects>>.

A review of the Bank's committed resources to energy generation projects reveals the same. Although the Bank has taken pride in consistently meeting its clean energy investment targets, it appears that its investments in fossil fuels is meeting the same targets.

In total, 52% of committed resources to electricity generation projects went to renewable energy, while 48% went to fossil fuels. If hydropower and geothermal projects are considered as carbon-intensive as well, then committed resources to carbon-intensive projects increases to 69%.

For the past nine years, the ADB has invested consistently and heavily in the Energy Sector. As data confirms, in the advancement of its "clean" energy agenda, the ADB has simultaneously continued to finance the advancement of fossil fuel projects. And, in some instances,

preferring more efficient coal technologies over renewable energy alternatives already available through new technological innovations (Box 1). While it has support numerous renewable energy projects in the past decade, the Bank has also simultaneously profited heavily in energy projects that have not only caused social and environmental damages to host communities in its member countries but have contributed to the worsening of the climate crisis—a crisis that disproportionately impacts some of its DMCs.

A closer look at the Bank's 2009 Energy Policy and subsequent pronouncements and commitments on energy and climate will surface enabling provisions or existing loopholes that have allowed for a carbon-intensive energy lending portfolio in the past decade.





## 2 | 2009 ENERGY POLICY AND RECENT DEVELOPMENTS

ADB's carbon-intensive energy portfolio is rooted on the fact that its "clean" energy agenda is a grave misnomer. Although climate change is considered as a key issue in the Policy, the Bank itself admits that *not* all of its clean energy investments are considered climate investments.<sup>46</sup> These clean energy investments can include some fossil fuel-related investments, such as natural gas infrastructure and efficiency improvements in fossil energy power plants, which are excluded from the joint Multilateral Development Bank (MDB) methodology for climate finance tracking.<sup>47</sup> Without a strict criteria for "clean" energy and a firm exclusion for financing of coal projects, the 2009 Energy Policy has enabled the Bank to make dirty commitments, providing crutch for the next generation of advanced coal plants.<sup>48</sup>

### RATIONALE FOR THE NEW CLEAN ENERGY AGENDA

The 2009 Energy Policy was adopted in response to three profound challenges in Asia and the Pacific—the foreseeable rapid increase of energy use, the disastrous threats and impacts of climate change, and the lack of access to modern and reliable energy services.<sup>49</sup>

The projected primary energy demand in developing Asia was then expected to almost double by 2030, driven mostly by projected rapid economic and population growth, industrialization,

and urbanization.<sup>50</sup> As for the climate crisis, the Policy in fact provided a grim picture of its impact to Asia and the Pacific:<sup>51</sup>

"The impacts of rapid climate change are expected to be profound in Asia and the Pacific. From the Himalayan highlands to the rich tropical forests of Southeast Asia, and in the Pacific islands, many natural ecosystems are vulnerable to climate change and some will probably be irreversibly damaged. The poorest people within the large populations of both sub-Saharan Africa and South Asia are most vulnerable to the effects of climate change. Scientists have observed abnormal weather patterns and impacts recently, including (i) more intense tropical storms, (ii) more severe and more frequent droughts and floods, (iii) accelerated melting of glaciers and rises in the sea level, (iv) higher frequency of forest fires, (v) shortages of freshwater, (vi) threatened crop production and aquaculture, (vii) higher incidence of heat-related and infectious diseases, and (viii) greater risk of loss of life and property."

In addressing these challenges, the Bank rec-



## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

ognizes an emerging energy and developmental issue—the rapid economic growth in Asia and the Pacific will not be sustainable if most of its energy demand is met by fossil fuels. Increased fossil fuel consumption will consequently increase greenhouse gas emissions, which will drive climate change and cause serious climate consequences for Asia and the Pacific.<sup>52</sup>

It is in response to these challenges that the 2009 Energy Policy was adopted and the rationale for a clean energy agenda was set. Since climate change poses the most difficult challenge with the gravest impacts if not addressed, it was expected that financing the transition away from fossil fuels will be a key principle in the Policy.

Instead, the Bank provided a gravely inadequate response to an already recognized real threat of climate change. It prioritizes energy conservation and efficiency as a “first step”<sup>53</sup>, together with the promotion of renewable energy<sup>54</sup>, **while encouraging “cleaner” fossil fuel technologies**<sup>55</sup>.

### JUSTIFICATIONS FOR FINANCING FOSSIL FUELS

At the onset, the 2009 Energy Policy set the tone that although economic growth fuelled by fossil fuels is unsustainable, there will be ***no absolute ban on financing for coal projects, and no timeline for phasing-out financing for other fossil fuels projects*** when it intentionally put primary focus on energy conservation and efficiency. Energy efficiency is only one among the many justifications for financing fossil fuel projects under the Policy.

### ENERGY EFFICIENCY AND “CLEAN” COAL

The Policy adopts as a principle and a pillar the prioritization and broadening of support for energy efficiency improvements. Coupled with encouraging the development of renewable energy, energy efficiency will supposedly ease growth in fossil fuel demand and upward pressure on energy prices, improve energy security, and reduce emissions of greenhouse gases.<sup>56</sup>

Although energy efficiency projects will suppos-

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The impacts of rapid climate change are expected to be profound in Asia and the Pacific. From the Himalayan highlands to the rich tropical forests of Southeast Asia, and in the Pacific islands, many natural ecosystems are vulnerable to climate change and some will probably be irreversibly damaged.

edly first and foremost ease growth in fossil fuel demand, the Bank ironically considers fossil fuel projects under this category such as **retrofitting of existing coal power plants**<sup>57</sup> and **installing combined heat and power systems**<sup>58</sup>.

The Policy also relates efficiency with cleaner technologies.<sup>59</sup> More efficient coal technologies are supposedly “clean” for emitting less GHG. The Policy provides that the ADB “will selectively support coal-based power projects **if cleaner technologies are adopted and adequate mitigation equipment and measures are incorporated into the project design**”.<sup>60</sup>

The Bank’s energy lending portfolio, and as shared in various case studies throughout this paper, show its track record for financing efficient and “clean” technologies. In the past decade, the Bank has funded the following coal power projects:

- ◉ Recycling waste coal for power generation (China, 2009)
- ◉ Visayas Base-load coal power project (Philippines, 2009)
- ◉ Mong Duong 1 Thermal power, coal-fired power plant (Vietnam, 2009)

- ◉ Shanxi energy efficiency and environment improvement (China, 2012)
- ◉ Jamshoro coal fired power generation project (Pakistan, 2013)
- ◉ Coal to cleaner fuel conversion for heating in Ger district and power generation (Mongolia, 2014)

In financing these projects, the ADB locked its DMCs to coal-sourced energy for at least two more decades—the average cost recovery period for coal power projects. Moreover, the ADB contributed to promoting coal expansion through the rise of new “clean coal” technologies.

Thus, contrary to what the Policy intended, support for efficient and “clean” coal technology has not eased growth in fossil fuel but has in fact provided a crutch for the next generation of advanced coal plants<sup>61</sup>. In fact, several “clean” coal advocates have cited Asia as a prime leader in utilizing new coal technologies. Even worse, Asia’s example is being cited as basis for countries like the U.S. and Australia to support and to provide federal loan guarantees to HELE coal power plants.<sup>62</sup>

### PROJECT IN THE PHILIPPINES: ADB’S FIRST COAL POWER GENERATION PROJECT UNDER THE 2009 ENERGY POLICY

Inaugurated in 2011, ADB financed a 200-megawatt (MW) coal power plant in Naga City, Cebu, in the Visayas group of islands. Operated by the Korean Electric Power Corporation-Salcon Power Corporation (KSPC), the plant was financed by the Bank in order to “address the power shortage in the region” by providing baseload power to the grid.<sup>63</sup>

The plant was described by the ADB as adopting “a more environment-friendly technology by using circulating fluidized bed (CFB) combustion boilers.” ADB cites CFB technology as “the next best solution to using pulverized coal technology,” given the 200 MW capacity of the plant, which disqualifies it from using supercritical technology.

#### Health costs

ADB claims that the project is compliant with ADB’s Energy Policy, which states that its selective support for coal will be based on whether “cleaner technologies are adopted and adequate mitigation equipment and measures are incorporated into the project design.”<sup>64</sup> In its 2009 Report and Recommendation of the President to the

Board of Directors, CFB was reported to be “a more environment-friendly technology, and will improve system reliability and energy security through diversification away from oil-based generation in the context of a smaller size grid.<sup>65</sup>” The report also claimed that using subcritical boiler technology is the least-cost option, and that adequate mitigation equipment and measures are incorporated in the project design.

However, affected communities raised concerns that CFB power plants, while reducing sulphur dioxide emissions through burning coal with air in a circulating bed of limestone, do not reduce emissions of other pollutants.<sup>66</sup> Additionally, CFB Plants produce about four times more coal combustion waste per megawatt of electricity compared to conventional coal burning plants.<sup>67</sup>

A member of the University of the Philippines Toxicology and Pharmacology Department issued findings on the coal ash samples collected from dump sites in Barangays Poblacion, Poblacion North, Colon and Pangdan in the City of Naga. The results indicated that there were “amounts of arsenic, cadmium and mercury in all the areas where the samples were taken.”<sup>68</sup> Many of these samples exceeded the average global background values and the limit values recommended by the European Union for arsenic, cadmium, and mercury. These results indicate that “the actual values of these toxic metals in fresh coal ash when the coal power plant is in actual operation would be much higher.”

#### **Leniency in considering ‘efficiency’ and ‘clean’ alternatives**

In terms of efficiency, CFB plants are less efficient than other coal plants such as supercritical coal plants, even as they can burn a variety of fuels. The ADB works around this flaw by stating that, for the small capacity of this Visayas coal plant, there are no efforts globally to adopt a supercritical technology.<sup>69</sup>

The Bank has also exercised leniency in its safeguards. In the “due diligence” supposedly done by the ADB as regards its social and environmental safeguards, it has been found that ambient air quality monitoring by the existing Naga Power Plant shows that particulate matter was significantly beyond the limits during the second quarter within the monitoring period.<sup>70</sup> Worse, the plant operator was ordered by the regional trial court to stop illegally and indiscriminately dumping its coal ash in open spaces in the city, affecting the health of residents.<sup>71</sup>

The Energy Policy states that DMCs “with smaller size grids that depend on oil-based power supply or imports from neighboring countries may need to install coal-based power plants using subcritical boiler technology”<sup>72</sup> in the name of power system reliability, energy security, and least-cost.

However, since the Philippines heavily relies on coal imports, the addition of the Visayas coal plant, and several other coal plants in the past decade, has in fact decreased the country’s energy security. More importantly, the reality of health costs shouldered by affected communities raises serious questions on the commitment of the ADB to lower fossil fuel consumption and improve public health.

**RELIABLE AND AFFORDABLE ENERGY**

The primary objective of the 2009 Energy Policy is “to help DMCs provide **reliable**, adequate, and **affordable** energy for inclusive growth in a socially, economically, and environmentally sustainable way.”<sup>73</sup> For some DMCs with smaller size grids that depend on oil-based power supply or imports from neighboring countries, the Policy states that power system reliability and least-cost energy may come from coal power plants. In the interest of economical and developmental needs, ADB will support coal base-load power plants, if found to be justified after due diligence.<sup>74</sup>

Even back in 2009, there was already a wealth of studies and reports exposing the true, hidden, and external costs of coal—societal costs attributable to climate change, human health impacts that result from air pollution, and fatalities due to major accidents resulting from mining operations.<sup>75</sup>

As a bank focusing on alleviating poverty, and recognizing that the poorest sections of society in less-developed countries are likely to suffer the most from climate change<sup>76</sup>, weighing social and environmental costs of coal and other fossil fuels should have been a critical factor in dictating its new policy on coal plants.

## **JAMSHORO POWER GENERATION PROJECT IN PAKISTAN: Pakistan's Costly Alternative<sup>77</sup>**

In 2013, ADB approved the establishment of a 600 MW coal power plant located north of Jamshoro town in the Jamshoro district of Sindh province, Pakistan. It was setup within the premises of the existing Jamshoro Thermal Power Station (JTPS), which is owned and operated by Jamshoro Power Company Limited, a subsidiary of GENCO Holding Company Limited. Financed by ADB, the project was intended to diversify the energy mix while offering a least-cost alternative to Heavy Fuel Oil (HFO)-based generation.<sup>78</sup> ADB has contributed a total of 30 million USD, and has also provided technical support and operational training to enhance the capacity of the plant operators.

**Least-cost**

The project supposedly adopts a least-cost approach to enhancing power generation capacity.<sup>79</sup> The project was pursued for reduced load sharing and power cost through least-cost, affordable, and dependable power supply. The supercritical generation units are claimed to be more efficient compared to the conventional HFO-fired plants, which in theory would provide “a reliable supply of electricity and lower both costs and greenhouse gas (GHG) emissions”<sup>80</sup>. From a deeper economic standpoint, “project economic viability was assessed based on expected benefits and costs over the project's economic life. The project is economically viable, with an economic internal rate of return of 36.3%, exceeding the economic opportunity cost of capital of 12%.”<sup>81</sup> However, the assessment of returns and capital investment failed to capture the potential loss through social and environmental costs.

On 2013, an environmental audit conducted by Hagler Bailly Pakistan Consultancy revealed that there were cases of open discharge of waste water in the operating area of JTPS that contaminated nearby land, vegetation, and water resources. Under the same management, Jamshoro Power Generation Project may contribute to further environmental degradation.<sup>82</sup>

There are also existing contamination issues, such as oil-contaminated soil, waste metals, and asbestos disposal. Such conditions may be exacerbated through the

project.<sup>83</sup> If not addressed, a substandard baseline can be used as justification for the presence of degraded conditions post-project.

In terms of mitigation, there are major risks such as an estimated emission of 3.3 million tons of CO<sub>2</sub> annually which contributes to the exceedance of ambient fine particulate matter standards by 4%. There is also a high risk of reduced efficiency and unit degradation if the government chooses to use “cheaper and dirtier coal.”<sup>84</sup> Overall, the grand total cost of Environmental Management and Monitoring including social augmentation and training cost amount to 5,363,280 USD.<sup>85</sup>

### **Viability of Renewable Energy**

Technological advances in off-grid, community-based electricity supply is a viable option touted in the Energy Policy, with a goal to increase its viability. This was not pursued since according to the project rationale, there is lack of potential of wind and solar energy, since their outputs are variable and would not meet the base-load requirements.”<sup>86</sup>

The project rationale is flawed for it sought renewable energy resources (wind and solar photovoltaic) not meant to be utilized as base-load. There are two categories of renewable power generators: dispatchable and variable. Dispatchable power generators such as reservoir concentrated solar thermal power plants can control their output within a specific range and are suitable to be used as base-load. “Many power systems already achieve high electricity shares from dispatchable renewable (e.g. in 2013: Austria 72%; Canada 61%; Colombia 79%; Iceland 100%; New Zealand 69%; and Norway 96%).”<sup>87</sup> Variable power generators on the other hand such as wind and solar photovoltaic is less controllable, thus they are incapable of covering base-load power demand at all times. Investment could have gone into developing said renewable energy capacity to meet load requirements. The large contribution of renewable energy options to lower both costs and carbon footprint should merit additional investment as promoted in the Energy Policy.<sup>88</sup>

### **Progress**

The contract agreement for the construction and operation of 2x660 MW (gross) supercritical power plants has already been signed and is targeted for commission on February 2018. The estimated date for the start of operation is on 31 December 2023, and it shall operate for at least 25 years. 100 acres of land was required to establish an ash pond alone.<sup>89</sup>

Amidst construction, some residents and environmental experts wonder why the local government is entertaining the coal industry despite the global movement of decarbonization. Irfan Yousuf, Director of Renewables at the Ministry of Energy of Pakistan, estimated the price of solar power at 4.8 rupees per-kilowatt compared to 8.5 rupees per-kilowatt of coal.

However, not everyone shares the same opinion. Some Pakistani authorities claim that using local coal would cut fuel imports by a significant amount, saving billions in foreign exchange.<sup>90</sup> This is not as significant as it seems since 80% of the fuel blend shall remain imported.<sup>91</sup>



## COMMERCIALIZATION OF THE COAL SECTOR AND OF MARGINAL AND ALREADY PROVEN OIL FIELDS

As a matter of principle, ADB will “**not finance coal mine development except for captive use by thermal power plants**”—that is, when a substantial part of the production of thermal coal is tied to long-term fuel supply contracts, or administrative allocation, for power plants.<sup>92</sup> The primary reason for this exception is to help start commercialization of the coal sector in the DMC.<sup>93</sup> The DMC should also agree to implement the provisions of the Extractive Industries Transparency Initiative (EITI) for all coal mines in its territory.<sup>94</sup>

This justification is once again contradictory to the main objectives of the Policy. If the Policy intends to address climate change, it would not finance coal mine development projects that will surely fuel existing coal plants. Financing such projects will only ensure that existing coal plants will have a continuous supply of coal. Consequently, proponents will be less discouraged to retire their coal plants at the soonest possible time.

ADB will also not support oil field exploration projects because of the associated risks. As for oil field development, the Bank may support these projects if they are **for marginal and already proven oil fields**.<sup>95</sup> Marginal fields refer to oil fields that may not produce enough net income to make them worth developing at a given time. However, should technical or economic conditions change, such a field may become a commercial field.<sup>96</sup>

Similar to the justification for financing coal mines, support for oil field development is also

mainly based on the commercialization of these oil fields, whether marginal or already proven. Instead of pursuing a policy of retiring these industries, the Policy intends to further support their commercialization. The exceptions are more economical than environmental, social, or developmental, despite the well-recognized environmental, health, and social impacts of these projects.

## MAXIMIZING ACCESS TO ENERGY FOR ALL

It is the second pillar of the Policy—maximizing access to energy for all—that stands as the all-encompassing justification for financing fossil fuels. It is for the sake of providing energy for all and meeting the electricity needs of the whole region that large capacity additions from coal-based generations are considered necessary.<sup>97</sup>

Meanwhile, for island communities, remote areas, and sparsely populated areas, the ADB will continue to finance modern, small, oil-based power plants.<sup>98</sup> This is supposedly due to the fact that other options are not feasible in providing access to these often off-grid areas.

Moreover, under the name of energy access, ADB will support (i) safety in coal mines, (ii) environmentally and socially sound mining practices and efficient use of coal for power generation, (iii) carbon capture and storage (or sequestration) once technologically viable, (iv) coal bed methane extraction and use, (v) coal gasification, (vi) coal scrubbers, (vii) waste coal utilization, and (viii) efficient coal transportation over land and sea.<sup>99</sup>

## KEY PRONOUNCEMENTS AND DEVELOPMENTS

Despite the contentious provisions of the 2009 Energy Policy, the Bank has taken great strides in mainstreaming climate change considerations through a number of pronouncements, and a new operational framework and strategy.

**Figure 9**  
**TIMELINE OF KEY CLIMATE PRONOUNCEMENTS AND DEVELOPMENTS**



### CLIMATE FINANCE REPORTING: LEADING THE CLIMATE INITIATIVE

Among ADB's first actions to establish itself as a climate leader among international financial institutions, is its initiative, together with six other MDBs, in establishing a joint MDB approach for climate mitigation and adaptation finance reporting in 2011.<sup>100</sup> The Joint MDB Approach was a response to the absence of a precise internationally-agreed definition of climate finance and in view of the fact that efforts to track climate finance lack transparency, comparability, and comprehensiveness at the time.<sup>101</sup>

While an important development, the key principles of the mitigation finance reporting reflected the same lenient standards of the 2009 Energy Policy.<sup>102</sup>

1. It is **activity-based** (whether a project or a project component), and not focused on purpose, the origin of the financial resources, or actual results.
2. The classification is **ex-ante project implementation**.
3. The joint approach measures **financial flows**, rather than greenhouse gas (GHG) emissions reduced by the investment.
4. An activity can be labelled as contributing to climate change mitigation if it promotes efforts to reduce or limit GHG emissions or enhance GHG sequestration. In the absence of a commonly-agreed method for GHG analysis among MDBs at the time, mitigation activities considered in this joint approach are **assumed to lead to emission reductions**, based on past experience and/or technical analysis.



Given that the key principles focus on activities that simply lessen GHG emissions, **without providing a clear target of GHG reduction**, the list of “mitigation activities” still included coal and other fossil fuel projects. Under the category of supply-side, brownfield energy efficiency, power plants that are considered as “mitigation activities” include **energy-efficiency improvement in existing thermal power plant (which often use coal or other fossil fuels), and thermal power plant retrofit to fuel switch from a more GHG-intensive fuel to a different, less GHG-intensive fuel type (which may still be other fossil fuels such as oil or natural gas)**.<sup>103</sup>

### COMMON PRINCIPLES FOR CLIMATE CHANGE MITIGATION AND ADAPTATION FINANCE TRACKING

In 2015, the joint MDB approach achieved one of its goals of gradually converging IFIs towards a harmonized approach for the tracking of climate change finance<sup>104</sup>. Together with the International Development Finance Club (IDFC)—a membership of 23 development banks—agreed on a set of Common Principles for financing of climate change mitigation and adaptation.

Since the Common Principles were developed through harmonizing existing approaches of the MDBs and IDFC, most key principles from the 2011 Joint MDB Approach were retained. However, the Common Principles emphasizes the importance of long-term structural changes especially in the fossil fuel combustion sectors (transport, and energy production and use).

In the power sector, it highlighted the need for energy production shift to renewable energy technologies and emphasized that not all activities that reduce GHGs are eligible to be counted towards MDB mitigation finance.<sup>105</sup> Surprisingly, in the list of activities eligible for classification as climate mitigation finance, the Common Principles still included coal and other fossil fuel projects for as long as they are retrofitted to fuel switch to a different and less GHG-intensive fuel type, or converted to a co-generation or CHP technology.<sup>106</sup>

“ADB has yet to issue guidelines for estimating project-level GHG emissions. Most importantly, it has yet to set a criteria on GHG emissions to screen carbon-intensive projects. The most that it has done is to set a bottom range carbon price to impact a project's economic internal rate of return.

## GUIDELINES TO ESTIMATE PROJECT-LEVEL GHG EMISSIONS: ACCOUNTING, SCREENING, AND REPORTING

In the same year, ADB also joined 13 IFIs in launching a Framework for a Harmonized Approach to Greenhouse Gas Accounting during project appraisal. The Framework aims to improve consistency and comparability across IFIs, provide increased reliability for other users of the data, set a good-practice standard for other IFIs, and facilitate the sharing of experience and lesson-learned.<sup>107</sup>

Under the Framework, ADB made three important commitments: (1) to account for the GHG emissions of its direct investment projects, **(2) to screen each proposed direct investment project for likely significant GHG emissions, and (3) to report annually on the aggregate GHG emissions for screened-in mitigation projects.** In the accounting process during project appraisal, ADB will:

1. Estimate the gross (or absolute) GHG emissions that a project is expected to produce on an annual basis for a representative year once it is complete and at normal operating capacity;
2. The project boundary for GHG accounting should include all activities, facilities, or infrastructure that the IFI is financing;
3. Gross emissions from construction may be included in the assessment of annual emissions using reasonable assumptions about the project lifetime;
4. GHG accounting will include Scope 1 and Scope 2 emissions (as defined in the GHG Accounting Protocol), and may include Scope 3 emissions attributable to a project, but this should be clearly stated in relevant policies, procedures, and results; and
5. Gross emissions are to be estimated for existing and greenfield projects.

Based on this Framework, ADB issued Guidelines for Estimating GHG Emissions of Clean Energy Projects and Transport Projects only.<sup>108</sup> Although the Guidelines do not cover other important sectors, this will hopefully guide the Bank in fulfilling its commitment to account for its GHG emissions and report emissions reduction for screened-in mitigation or “clean energy”

projects. This, however, remains to be seen as the Bank's 2018 Annual Report and the MDB's 2018 Joint Report on Climate Finance still does not include a report on GHG accounting.<sup>109</sup>

In terms of screening projects with likely significant GHG emissions especially coal projects and other fossil fuel projects not considered “clean energy”, ADB has yet to issue guidelines for estimating project-level GHG emissions. Most importantly, it has yet to set a criteria on GHG emissions to screen carbon-intensive projects. The most that it has done is to set a bottom range carbon price to impact a project's economic internal rate of return.<sup>110</sup>

## CLIMATE ACTION IN FINANCIAL INSTITUTIONS INITIATIVE: MAINSTREAMING CLIMATE ACTION

On December 2015, in the wake of the adoption of the landmark Paris Agreement in the 21<sup>st</sup> Conference of Parties (COP) to the United Nations Framework Convention on Climate Change, ADB was among the 26 public and private financial institutions that took a climate leadership role by launching the 5 Voluntary Principles for Mainstreaming Climate Action (now the Climate Action in Financial Institutions Initiative).<sup>111</sup>

The Initiative adapted the global objectives of the Paris Agreement as part of its vision, including holding the increase in the global mean surface temperature (GST) to well below 2 degrees Celsius (°C) above pre-industrial levels and pursue efforts to limit temperature increase to 1.5 °C.<sup>112</sup>

It acknowledged the pivotal role that financial institutions play in achieving this vision by aiming to mainstream climate change considerations throughout their operations, and in their investing and lending activities. This will enable financial institutions to deliver better, more sustainable, short-term and long-term results—both developmentally and financially. More specifically, “mainstreaming” refers to a shift from financing climate activities in incremental ways, to making climate change—both in terms of opportunities and risk—a core consideration and a “lens” through which institutions deploy capital.<sup>113</sup>

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

The five voluntary principles to mainstream climate action are:

1. Commit to climate strategies,
2. Promote climate smart objectives,
3. Manage climate risks,
4. Improve climate performance, and
5. Account for your climate action.

### ADB 2016 OUTLOOK: DEROGATING FROM THE 1.5°C GOAL

Acting on its new climate action initiative, ADB released an update to its 2016 Asian Development Outlook (ADO) entitled “Meeting the Low-Carbon Growth Challenge”<sup>114</sup> months later. The Update Report highlighted important economic and development issues in developing Asia, specifically in relation to addressing climate change. It also made strong statements with regard to Asia’s transition to a low-carbon future, such as:

- ⊙ The returns on sound climate policy far outweigh their costs.<sup>115</sup>
- ⊙ Low-carbon energy generation offers the most mitigation potential.<sup>116</sup>
- ⊙ International action must be rapid to meet the global climate challenge.<sup>117</sup>

Although it is a much appreciated update on the ADO 2016, the Report revealed a glaring fact—less than a year from launching the climate initiative, ADB is already derogating from its pivotal role in achieving the 1.5°C global climate goal. The Report gravely diminished the importance of pursuing efforts to limit GST to 1.5°C goal by indicating it as a mere parenthetical remark. In describing the goal of the Paris Agreement, the Report stated:<sup>118</sup>

“The goal of the Paris Agreement is to limit the rise in global mean surface temperature to less than 2 degrees Celsius (°C) above pre-industrial levels (if possible, to less than 1.5°C higher).”

In fact, in the entire ADO 2016 Update, the 1.5 °C goal was mentioned only twice compared to the 2°C, which was mentioned over 130 times. All

throughout the Report, the 2°C was referenced as the benchmark or the goal. The Update Report eventually set the tone for all subsequent ADB Reports on climate change—all pertaining to the 2°C goal and not the 1.5 °C goal.

### GUIDELINES FOR THE ECONOMIC ANALYSIS OF PROJECTS: SHADOW CARBON PRICING AND EXTERNAL COSTS

In its revised Guidelines for the Economic Analysis of Projects released on March 2017<sup>119</sup>, the Bank integrated a shadow carbon price into its economic analysis of projects to account for the cost of carbon emissions. Only projects that can hurdle the Bank’s required economic internal rate of return, which includes carbon valuation, will be approved.

Currently, MDBs have set shadow carbon prices at different levels, ranging from 19 to 77 USD per ton of CO<sub>2</sub> (tCO<sub>2</sub>), with a median price of about 38 USD. Compared to the prices of other MDBs, ADB’s pricing is in the bottom range carbon or among the lowest. ADB imposes a modest carbon price that is below average, at USD 36.30/tCO<sub>2</sub>.<sup>120</sup> This will be increased at 2% per annum in real terms, as well as adjusted for inflation.<sup>121</sup> Needless to say, to effectively implement shadow carbon pricing, ADB has to start GHG accounting.

After years of civil society organizations and affected communities emphasizing the external costs of coal power projects, the Bank also identified external costs such as air and water pollution and other environmental hazards, as factors in its economic analysis of projects.<sup>122</sup>

### CLIMATE CHANGE OPERATIONAL FRAMEWORK 2017-2030: NEW FRAMEWORK, OLD POLICY

A few months later, ADB released its Climate Change Operational Framework 2017-2030 (CCOF2030) in anticipation of ADB’s new strategy—Strategy 2030.<sup>123</sup> The CCOF2030 will provide broad direction and guidance for enhancing resilience and strengthening climate actions in ADB’s operations and business processes, including its country partnership strategies, country operations business plans, sector and the-

matic strategies, DMC programs and projects, technical assistance, and knowledge support.<sup>124</sup>

The primary objective is to support the low-carbon transition, in line with the Paris Agreement, by making finance flows consistent with a pathway toward low GHG emissions and climate-resilient development.<sup>125</sup> Although the Framework mentions the 1.5°C goal in reference to the Paris Agreement, it refers to it as merely an aspirational target<sup>126</sup>. The CCOF2030 was still drafted with the 2° as the actual target.<sup>127</sup>

The Framework specifically mandates the ADB to mainstream climate considerations into strategies, policies, plans, and projects,<sup>128</sup> and to support policy reform and harmonization in DMCs.<sup>129</sup> Despite this, the Framework did not require the **necessary review and update of the 2009 Energy Policy as an initial step**.

**There is also a lack of urgent action on carbon-intensive pipeline projects.** Although the Framework requires that pipeline projects to be climate-proofed,<sup>130</sup> there is no mention of divestments from coal projects through closing and/or terminating of all pipeline projects. On proposed fossil fuel projects, especially coal projects, there is no absolute position on the phase-out of these projects. In fact, the CCOF2030 still states that there is room for new coal capacity **if it includes carbon capture and storage**.<sup>131</sup>

### STRATEGY 2030: PRIORITIZING RE WITHOUT PHASING OUT FOSSIL FUELS

On July 2018, ADB launched its Strategy 2030, which sets the course for ADB's efforts to respond effectively to the region's changing needs.<sup>132</sup> The Strategy 2030 ensures that ADB's aspirations are **aligned with major global commitments including the Paris Agreement**, especially in recognition of the fact that achieving major global commitments will depend critically on the success of the region.<sup>133</sup> Strategy 2030 commits that ADB's future operations will be designed to help meet goals and targets outlined in the Paris Agreement.<sup>134</sup>

The Strategy 2030 included "Tackling Climate Change, Building Climate and Disaster Resilience, and Enhancing Environmental Sustain-

“

The Framework specifically mandates the ADB to mainstream climate considerations into strategies, policies, plans, and projects, and to support policy reform and harmonization in DMCs. Despite this, the Framework did not require the necessary review and update of the 2009 Energy Policy as an initial step.

ability” as one of the seven operational priority areas. ADB will scale up support to address climate change, disaster risks, and environmental degradation, set higher climate operations target, and accelerating low greenhouse gas emissions development.<sup>135</sup> ADB will **screen** its projects rigorously for climate and disaster-related risks.<sup>136</sup>

As regards climate mitigation actions, it will increase committed operations supporting climate change mitigation and adaptation by 2030 to 75%,<sup>137</sup> **prioritize** investments for low GHG emission energy, and **encourage** DMCs to shift to a low GHG emission development path in line with their nationally determined contributions under the Paris Agreement<sup>138</sup>. ADB will pursue this through the selective use of concessional financing, greater engagement with the private sector, and support for innovative PPPs but still **not through completely stopping financing for fossil fuel projects and assisting DMCs to phase out coal financing.**

## MDBS' ALIGNMENT APPROACH TO THE PARIS AGREEMENT: RECOGNIZING THE NEED FOR RAPID TRANSITION

On December 2018, in light of the recent IPCC Special Report on Global Warming of 1.5°C, and in time for the 24<sup>th</sup> COP of the UNFCCC, ADB, together with nine other MDBs, announced that they are working together to develop a dedicated approach to operationalize the Paris Agreement. Six building blocks were identified as core areas for alignment, which included: (1) accelerated contribution to the transition through climate finance, and (2) align internal activities.<sup>139</sup>

Under the Alignment Approach, ADB committed to operationalize new approaches to bridge the climate finance gap and **accelerate the transition to low-emissions and climate-resilient development pathways** and to ensure that its internal operations, including facilities and other **internal policies**, are also in line with the objectives of the Paris Agreement.





### 3 | THE IMPERATIVE TO DECARBONIZE

In many previous occasions, the Bank has dismissed the need to have a clear policy excluding financing for coal power projects. Time and again, it would emphasize that even though it does not exclude financing for all coal projects in its Energy Policy, it has been years since it last funded a coal power plant. Further, ADB believes that clean energy will power Asia's future hence, its lending portfolio has no place for dirty energy.<sup>140</sup>

In last year's Asian Clean Energy Forum, the Bank backtracked on this commitment. Re-echoing justifications in the Energy Policy, then-ADB President Takehiko Nakao expressed doubts on whether the Bank will "totally dismiss the possibility of coal projects because in some countries there's no access to other options."<sup>141</sup>

This confirmed well-justified concerns among civil society organizations and coal-affected communities who have long demanded for a more stringent energy policy—without a clear policy on paper that excludes financing for coal power projects, the Bank will always be open to funding coal projects.

A review of the global energy transformation, rising climate change concerns, deteriorating air quality, other MDB's support for coal power generation, and available energy choices among DMCs should highlight the considerable challenge that Developing Asia is facing. It is the last bastion for the coal industry, disproportion-

ately exposing it to deteriorating air quality and climate impacts. By continually relying on coal and other fossil fuels, it faces issues of energy security and affordability. Ultimately, the Bank should be convinced that it is imperative to decarbonize now.

#### GLOBAL ENERGY TRANSFORMATION

In the past decade, the global energy landscape has transformed drastically, seeing almost a reversal of situation between coal and renewable energy technologies. Developing Asia is now the bastion of coal, meanwhile a wave of retirement of coal power plants is seen in the US and EU. Coal plants are facing stranding risks, while renewable energy is becoming an increasingly attractive investment. These stranding risks and stricter environmental regulations have made coal electricity much costlier. On the other hand, the cost of renewable energy technologies have deflated remarkably.

#### NEW WORLD ENERGY DEMAND OUTLOOK

The 2009 Energy Policy is still premised on an obsolete energy demand outlook that is severely reliant on fossil fuels, citing International Energy Agency's (IEA) World Energy Outlook 2008 at the time. Even the IEA's 2018 World Energy Outlook reflects drastically different scenario—much less demand for fossil fuels, and four times more for other renewables by 2030 (Table 1).

**Table 1**  
**World Primary Energy Demand (MTOE), 2008 v. 2018 Data**

| Item              | According to World Energy Outlook 2008 |        | According to World Energy Outlook 2018 |           |
|-------------------|--|--------|--|-----------|
|                   | 2015                                   | 2030   | 2015                                   | 2030      |
| Coal              | 4,023                                  | 4,908  | 3,846.3                                | 2,416.4   |
| Oil               | 4,525                                  | 5,108  | 4,323.3                                | 3,985.1   |
| Gas               | 2,903                                  | 3,670  | 2,933.2                                | 3,553.6   |
| Nuclear           | 817                                    | 901    | 670.3                                  | 1,013.3   |
| Hydropower        | 321                                    | 414    | 335.7                                  | 492       |
| Biomass and waste | 1,375                                  | 1,662  | 1,317.3                                | 1,276.7   |
| Other renewables  | 158                                    | 350    | 203.5                                  | 1,083.1   |
| Total             | 14,121                                 | 17,014 | 13,629.60                              | 13,820.20 |

Source: IEA, WOE 2008 and 2018

However, the Bank should not rely on energy demand outlooks that still put more reliance on fossil fuels than renewable energy. In the context of the climate emergency, the Bank is expected to rely on more ambitious reference scenarios, and to cultivate an enabling environment for investments in renewable energy technologies that will play a critical role in its reference scenario.

The Bank can Intergovernmental Panel on Climate Change (IPCC) recommends four pathways scenarios based on hard science and evidence that would assist countries in addressing the climate emergency. In the first pathway scenario, by 2030, coal has to be 70% less than 2010 levels, oil 37% less, and fossil gas 25% less.

## COAL EXPANSION IN DEVELOPING ASIA<sup>142</sup>

Since 2009, there has been drastic coal expansion globally, mostly in Developing Asia. On average, there is an additional coal capacity of approximately 71 GW every year in Developing Asia alone. This is seven times more than the average additional coal capacity in the rest of the world at approximately 9 GW every year on-ly.<sup>143</sup>

By January 2019, the total capacity of proposed coal plants in Developing Asia has reached 341 GW. As for the rest of the world, only less than a fifth or approximately 62 GW worth of proposed coal plants.

Although coal expansion in the past decade is mostly attributed to China and India, other countries in South Asia and Southeast Asia have seen a spike in proposed coal plants, dubbing the two Asian regions the last bastion of the coal industry.<sup>144</sup>

**Table 2**  
**Coal Plants in Developing Asia by Region, 2019 (MW)**

| Region     | Announced | Pre-permit | Permitted | Announced + Pre-permit + Permitted | Construction | Shelved | Operating | Cancelled 2010-2018 |
|------------|-----------|------------|-----------|------------------------------------|--------------|---------|-----------|---------------------|
| East Asia  | 18,520    | 41,849     | 25,695    | 86,064                             | 144,937      | 283,725 | 1,094,842 | 462,876             |
| South Asia | 24,373    | 33,730     | 25,194    | 83,297                             | 42,098       | 103,061 | 225,205   | 516,857             |
| SE Asia    | 26,695    | 24,046     | 16,188    | 66,929                             | 29,561       | 40,286  | 73,715    | 72,454              |
| Total      | 122,858   | 135,215    | 83,098    | 341,171                            | 237,633      | 481,160 | 2,023,935 | 1,273,081           |
| East Asia  | 18,520    | 41,849     | 25,695    | 86,064                             | 144,937      | 283,725 | 1,094,842 | 462,876             |
| South Asia | 24,373    | 33,730     | 25,194    | 83,297                             | 42,098       | 103,061 | 225,205   | 516,857             |
| SE Asia    | 26,695    | 24,046     | 16,188    | 66,929                             | 29,561       | 40,286  | 73,715    | 72,454              |
| Total      | 122,858   | 135,215    | 83,098    | 341,171                            | 237,633      | 481,160 | 2,023,935 | 1,273,081           |

Source: CoalSwarm Global Coal Plant Tracker, January 2019

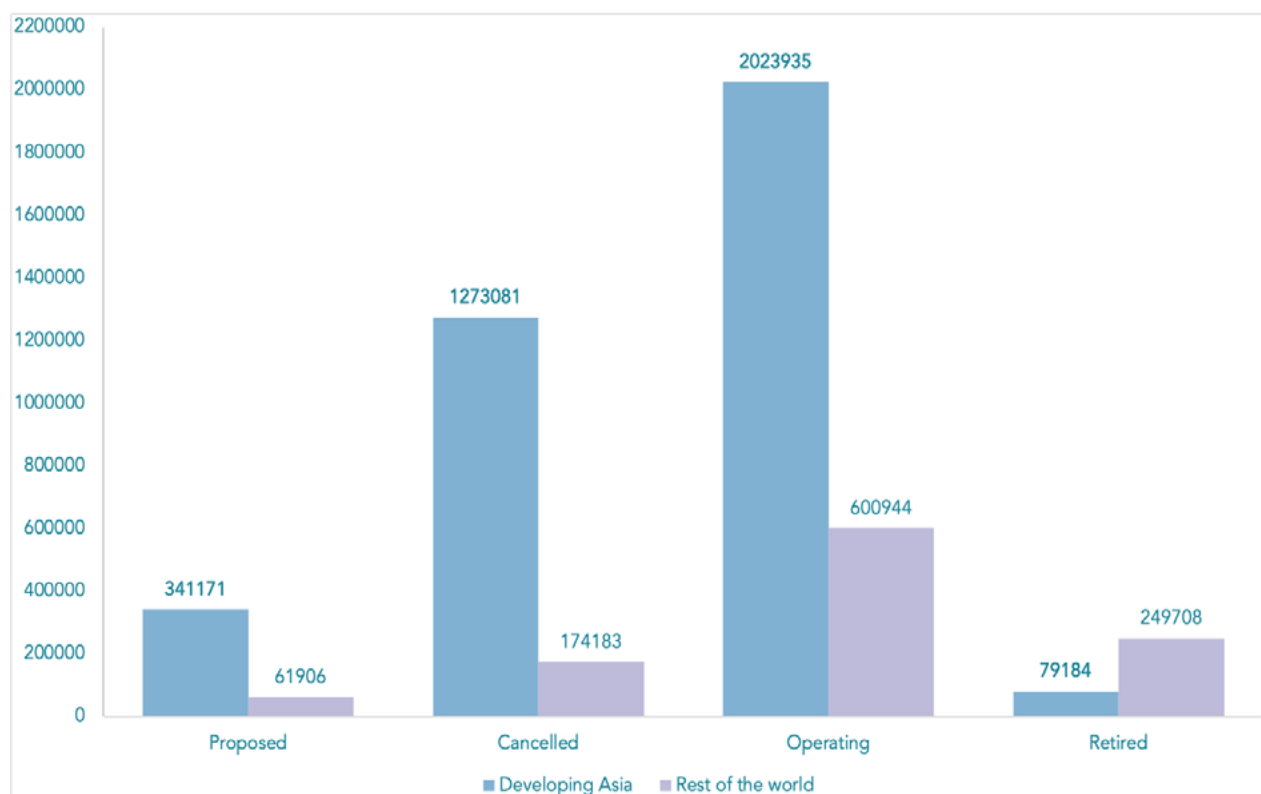


## COAL RETIREMENT IN DEVELOPED COUNTRIES<sup>145</sup>

As the coal fleet continue to expand in Developing Asia, there is expectedly less retiring coal plants. As of 2019, the total capacity of retired coal plants in the past decade is 79 GW only, which is equal to only 3.91% of the total operating coal plants.

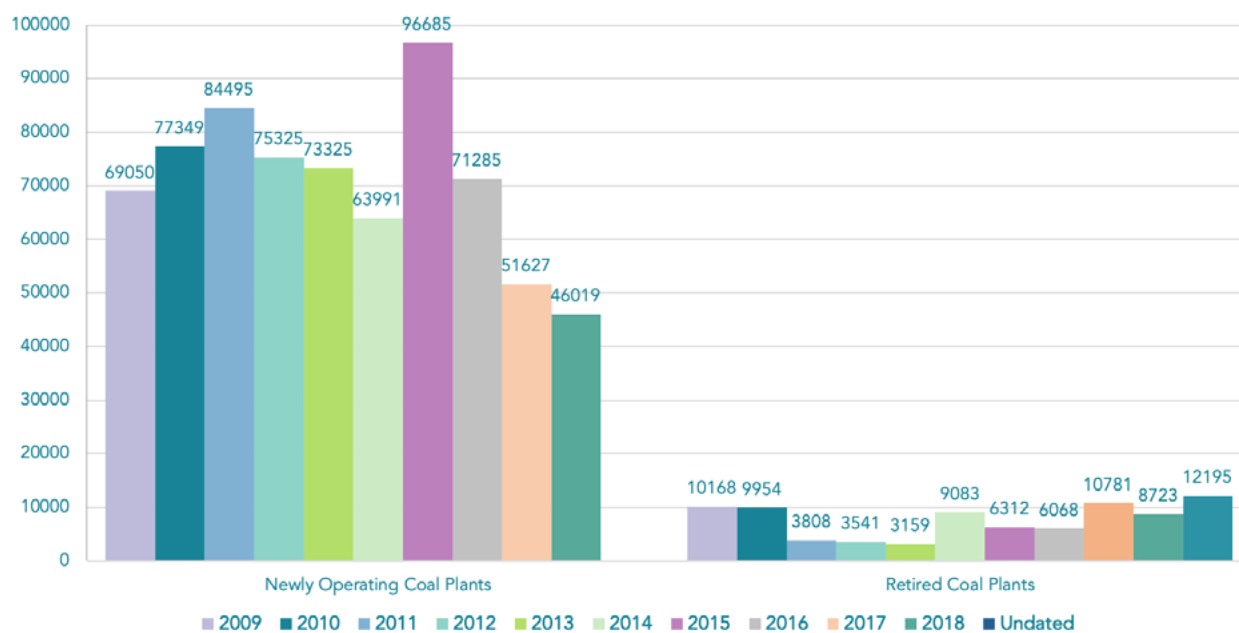
This is of course at odds with the global energy transformation. Other countries are increasing efforts to retire existing coal plants. Excluding Developing Asia, the total capacity of coal plants that have been retired for the past decade is approximately 250 GW, with an average of 23 GW of coal capacity retired every year.

**Figure 10**  
**Proposed, Cancelled, Operating, Retired Coal Plants, 2019 (MW)<sup>146</sup>**



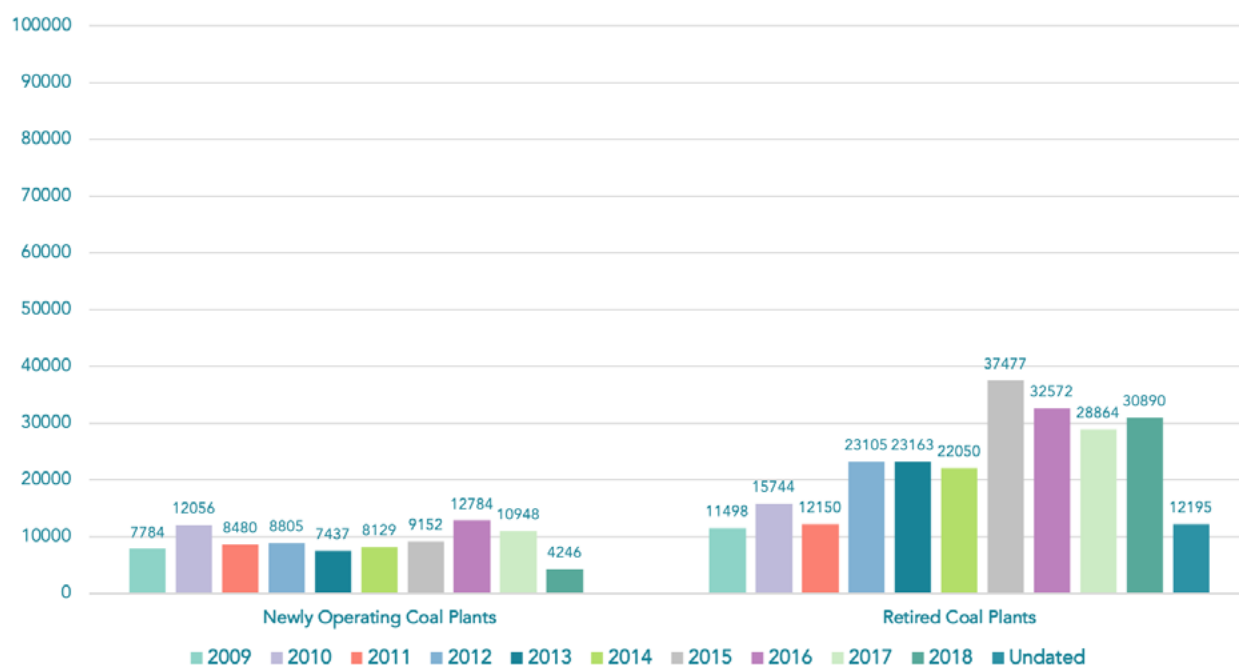
Source: CoalSwarm Global Coal Plant Tracker

**Figure 11**  
**Newly Operating and Retired Coal Plants in Developing Asia, 2009-2018 and undated**



Source: CoalSwarm Global Coal Plant Tracker, January 2019

**Figure 12**  
**Newly Operating and Retired Coal Plants in the Rest of the World, 2009-2018 and undated**



Source: CoalSwarm Global Coal Plant Tracker, January 2019

### RISING COST OF COAL ELECTRICITY

Coal was previously considered cheap or the least-cost option. This has been countered with several studies and reports that have found coal an expensive energy resource when negative externalities such as social, health, and environmental costs are considered. Today, even without considering externalities, coal is no longer cheap or the least-cost option.

In its new report entitled “Powering down coal: Navigating the economic and financial risks in the last years of coal power”, Carbon Tracker made a bold statement—with or without climate policy coal power is increasingly a high-cost option due to rising operating costs, rising fuel costs, and stranded assets.<sup>147</sup>

As of 2018, 35% of global coal capacity has a higher operating cost than building new renewables. This may further increase up to 96% by 2030 according to the report. The rise in operating cost is mainly due to high fuel costs. Due to skyrocketing fuel costs, 42% of coal capacity operating in 2018 could be losing money. As coal plants continue to face more stringent air pollution regulations, carbon pricing, and increasing competition from renewable energy, there will be further cost pressures, making 72% of the fleet cashflow negative by 2040.<sup>148</sup>

Carbon Tracker also warned investors to adjust investments in line with the emissions trajectories required to limit global warming, or, otherwise, face stranded asset risk. Stranded assets may be in the form of regulatory stranding (due to a change in policy of legislation), economic stranding (due to a change in relative costs/prices), and physical stranding (due to distance/flood/drought).

According to its reports, stranded assets are now “generally accepted to be fossil fuel supply and generation resources which, at some time prior to the end of their economic life (as assumed at the investment decision point), are no longer able to earn an economic return (i.e. meet the company’s internal rate of return), as a result of changes associated with the transition to a low-carbon economy.”<sup>149</sup> Most positive stranded asset risk is happening in Developing Asia.<sup>150</sup>

### GLOBAL DEFLATION OF RE TECHNOLOGIES

Meanwhile, renewable power technologies are becoming an increasingly competitive way to meet new generation needs after years of steady cost decline according to the International Renewable Energy Agency’s (IRENA) 2017 Annual Report.<sup>151</sup> Majority of utility-scale renewable power generation technologies experienced a remarkable decline in global levelized cost of electricity (LCOE), except for geothermal and hydropower technologies.<sup>152</sup>

Utility-scale solar photovoltaic (PV) has seen one of the most remarkable deflation in costs, being able to increasingly compete head-to-head with conventional power sources, even without financial support.<sup>153</sup> Since the end of 2009, solar PV module prices have decreased by 81%. When computed along with reductions in balance of system (BoS) costs, the global weighted average LCOE of utility-scale solar PV fell 73% between 2010 and 2017, to USD 0.10/kWh.<sup>154</sup>

IRENA also forecasts that new solar PV and onshore wind will increasingly be cheaper than the marginal operating cost of existing coal-fired power plants. By 2018, the global average generation costs of RE technology such as Onshore Wind has gone down significantly from 0.075 USD/kWh in 2010 to 0.045 USD/kWh, and Solar PV from 0.375 USD/kWh in 2010 to 0.05 USD/kWh.<sup>155</sup>

### THE 10-YEAR CLIMATE RACE

While the starkly different energy landscape establishes the imperative to update and decarbonize the 2009 Energy Policy, the IPCC’s Special Report on Global Warming of 1.5°C released on October 2018 lays a strong foundation for its urgency. The harrowing Special Report may be summarized in three strong points.

**First, due to human activities, global warming has reached approximately 1.0°C above pre-industrial levels, and is likely to reach 1.5°C between 2030 and 2052.**<sup>156</sup> This serves as a warning that we are only 0.5°C short and 11 years from breaching the Paris Agreement’s goal of limiting global warming to 1.5°C by the

end of the century. After 24 years of negotiations before the UNFCCC, we are set to miss our targets in over a decade. Developing Asia, as the last bastion of coal, of course plays a crucial role on whether we will miss or reach this target.

**Second, the world facing a climate catastrophe is an unrecognizable and dire world at 1.5°C global warming, and even worse at global warming of 2°C.** While climate impacts already threaten long-term sustainability of de-

velopment and cause significant loss of lives and economic damage, we are braced to expect far worse in the coming decades. As for the ten most climate-vulnerable countries for the past decade,<sup>157</sup> five of which are ADB DMCs<sup>158</sup>, they are expected to experience the most adverse impacts.

The World Resources Institute (WRI) provides an easy to digest summary of the climate impacts of 1.5°C and 2°C warmer world.<sup>159</sup>

**Table 3**  
**IMPACTS OF 1.5°C AND 2°C GLOBAL WARMING**

| CLIMATE IMPACT   | 1.5°C                       | 2°C                         | 2°C IMPACTS      |
|--|-----------------------------|-----------------------------|------------------|
| <b>Extreme heat</b><br>Global population exposed to severe heat at least once every five years | 14%                         | 37%                         | 2.6x worse       |
| <b>Sea-ice-free arctic</b><br>Number of ice-free summers                                       | At least 1 every 100 years  | At least 1 every 10 years   | 10x worse        |
| <b>Sea level rise</b><br>Amount of sea level rise by 2100                                      | 0.40 meters                 | 0.46 meters                 | 0.06 meters more |
| <b>Species loss:</b><br>Species that lose at least half of their range                         |                             |                             |                  |
| <b>Vertebrates</b>   | 4%                          | 8%                          | 2x worse         |
| <b>Plants</b>  | 8%                          | 16%                         | 2x worse         |
| <b>Insects</b>   | 6%                          | 18%                         | 3x worse         |
| <b>Ecosystems</b><br>Amount of Earth's land area where ecosystems will shift to a new biome    | 7%                          | 13%                         | 1.86x worse      |
| <b>Permafrost</b><br>Amount of Arctic permafrost that will thaw                                | 4.8 million km <sup>2</sup> | 6.6 million km <sup>2</sup> | 38% worse        |
| <b>Crop yields</b><br>Reduction in maize harvests in tropics                                   | 3%                          | 7%                          | 2.3x worse       |
| <b>Coral reefs</b><br>Further decline in coral reefs   | 70-90%                      | 99%                         | Up to 29% worse  |
| <b>Fisheries</b><br>Decline in marine fisheries  | 1.5 million tonnes          | 3 million tonnes            | 2x worse         |

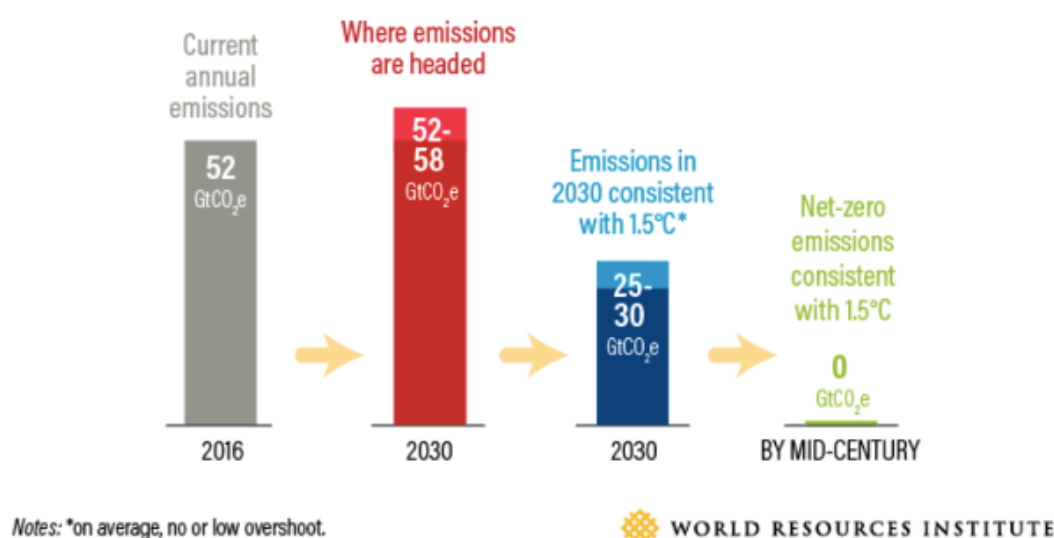
Source: WRI, 2018

**Third, to keep global warming at not more than 1.5°C and to avoid adverse climate impacts, we only have less than 10 years to slash global net anthropogenic CO<sub>2</sub> emissions by about 45% from 2010 levels, and 30 years to reach net zero CO<sub>2</sub> emissions.** Our current pathways, however, are headed the opposite direction from the modelled pathways under the Special Report.

In this context, the Special Report describes the action we need to take as systemic, unprecedented in terms of scale but not necessarily in terms of speed. In other words, it is a race that we can win.

It also bears stressing that according to the Special Report, in the first modelled 1.5°C pathway the use of coal for electricity should be reduced to close to 0% by 2050.

**Figure 13**  
**CURRENT GLOBAL WARMING PATHWAY V. 1.5°C GLOBAL WARMING PATHWAY**



Source: WRI, 2018

## DEADLY AIR POLLUTION

On top of the climate emergency which threatens the lives of many communities, especially the most vulnerable, deadly air pollution from fossil fuel combustion also threatens the lives of many. According to the World Health Organization, 9 out of 10 people breathe polluted air. People in Southeast Asia breathe one of the highest ambient air pollution levels, with annual mean levels often exceeding more than 5 times WHO limits. The reported major sources for particulate matter pollution are energy inefficiency in households, industry, agriculture, and transport sectors, and coal-fired power plants.

IQAir's 2019 World Air Quality Report confirms the WHO findings on the causes of air pollution. The Report is based on data from the world's largest centralized platform for real-time air quality data, combining efforts from thousands of initiatives run by citizens, communities, com-

panies, non-profit organizations and governments. According to the Report:

"Regionally, South Asia, Southeast Asia, and the Western Asia carry the highest burden of fine particulate matter (PM<sub>2.5</sub>) pollution overall, with only 6 of 355 cities included meeting WHO annual targets in these areas collectively. Cities within these regions also rank highly in the top of the global city ranking. Of the world's top 30 most polluted cities during 2019, 21 are located in India, 27 in South Asia, and all the top 30 cities are within greater Asia."

Common contributors to air pollution in East Asia, Southeast Asia and South Asia are vehicle exhaust, biomass burning, industry and coal-

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

based energy production, and the lack of regulations and enforcement of industrial emissions, oil-based road transportations, and domestic heating.

The effect of breathing polluted air cannot be understated. 7 million people die every year due to ambient outdoor and household air pollution which cause diseases including stroke, heart disease, lung cancer, chronic obstructive pulmonary diseases and respiratory infections, including pneumonia.<sup>160</sup>

The Energy Policy Institute of the University of Chicago has developed an Air Quality Life Index (AQLI), which estimates the relationship between air pollution and life expectancy, to view the gain in life expectancy if communities met World Health Organization (WHO) guidelines, national standards or some other standard.<sup>161</sup>

Their Report found that air pollution is the world's top killer, shortening an average person's life by nearly 2 years—more than devastating communicable diseases like tuberculosis and HIV/AIDS, behavioral killers like cigarette smoking, and even war. Among air pollutants, particulate matter—which is predominantly the result of fossil fuel combustion—is recognized as the deadliest pollutant and the single greatest threat to human health.<sup>162</sup>

## EIB'S AMBITIOUS POLICY: PHASING OUT ALL CARBON-INTENSIVE PROJECTS

The momentum for decarbonization is building not only among MDBs but among other financial institutions as well, including private banks. According to the Institute for Energy Economics and Financial Analysis, over 100 globally significant institutions have adopted or announced divestment or restriction policies from thermal coal, including 40% of the top 40 global banks and 20 globally significant insurers (Table 4). Every two weeks, a bank, insurer, or lender announces new restrictions on financing for coal.<sup>163</sup>

“Among air pollutants, particulate matter—which is predominantly the result of fossil fuel combustion—is recognized as the deadliest pollutant and the single greatest threat to human health.

**Table 4.**  
**Global Financial Institutions Restricting Coal as of February 2019**

| Global financial institutions >US\$10bn AUM | Total |
|---|-------|
| Multilateral Development Banks              | 7     |
| Export Credit Agencies                      | 35    |
| Development Finance Institutions            | 9     |
| Insurers/Reinsurers                         | 20    |
| Global Banks (Private)                      | 34    |

*Source: IEEFA, February 2019*

If even private banks, insurers, and reinsurers, whose primary purpose is to maximize profits, have already imposed restrictions on financing for coal, development banks like the ADB, whose primary purpose is to assist in achieving development goals, should be adopting even more ambitious restrictions or divestment policies. The following MDBs have already adopted restrictions on coal financing (Table 5).

**Table 5.**  
**Multilateral Development Banks Restricting Coal**

| Multilateral Development Banks                   | First Restriction | Latest Restriction |
|--|-------------------|--------------------|
| World Bank                                       | 2013              | Oct 2018           |
| European Investment Bank (EIB)                   |                   | Nov 2019           |
| Asia Infrastructure Investment Bank              |                   | Jan 2017           |
| New Development Bank (BRICS bank)                |                   | July 2018          |
| International Finance Corporation                |                   | Oct 2018           |
| Asian Development Bank                           |                   | Oct 2018           |
| European Bank for Reconstruction and Development |                   | Dec 2018           |

*Source: IEEFA, February 2019*

However, it is only the EIB that has adopted an energy policy that phases out all investments in carbon-intensive projects starting 2022. In its new energy lending policy, entitled *Supporting the Energy Transition*, EIB adopts the decarbonization of the energy supply as one of its core components by imposing a stringent emission standard of 250 gCO<sub>2</sub>/kWh for all power generation projects and heating and cooling projects. Compared to the emissions of most power generation projects, including some carbon-emitting renewable energy power projects, this standard is indeed strict, excluding all unabated fossil fuel projects and conventional hydropower projects (Table 6).



**Table 6.**  
**Emissions of selected electricity supply technologies (in gCO<sub>2</sub>eq/kWh)<sup>164</sup>**

| Options                  | Lifecycle Emissions<br>(incl. albedo effect)<br>Min/Median/Max |
|--------------------------|--|
| Coal – Pulverized Coal   | 740/820/910  |
| Gas – Combined Cycle     | 410/490/650  |
| Biomass – cofiring       | 620/740/890  |
| Biomass – dedicated      | 130/230/420  |
| Geothermal               | 6/38/79  |
| Hydropower               | 1/24/2200  |
| Nuclear                  | 3.7/12/110   |
| Concentrated Solar Power | 8.8/27/63  |
| Solar PV – rooftop       | 26/41/60   |
| Solar PV – utility       | 18/48/180  |
| Wind onshore             | 7/11/56  |
| Wind offshore            | 8/12/35  |

**Source: IPCC, 2014**

This effectively **phases out all support for energy projects reliant on unabated fossil fuels** and even for a few carbon-emitting renewable energy projects, including: <sup>165</sup>

- ⊙ The production of oil and natural gas;
- ⊙ Traditional gas infrastructure (networks, pipelines, storage, refining facilities);
- ⊙ Power generation technologies resulting in GHG emissions above 250 gCO<sub>2</sub> per kWh of electricity generated, averaged over the lifetime for gas-fired power plants seeking to integrate low carbon fuels; and
- ⊙ Large-scale heat production infrastructure based on unabated oil, natural gas, coal or peat.

### CARBON AND RESOURCE-INTENSIVE RENEWABLES

Under this component, EIB applies a new stringent emission standard of 250 gCO<sub>2</sub>/kWh for all power generation projects and heating and cooling projects also called co/tri-generation projects, including even renewable energy projects with GHGs emissions (e.g. large hydropower or geothermal), thermal power plants using a high proportion of low carbon fuels (e.g. low-carbon gases, bioliquid fuels), decentralized energy (e.g. decentralized hybrid systems in islands).<sup>166</sup>

For geothermal projects specifically, artificial simulation and resulting environmental impacts will be closely scrutinized by the EIB on a case-by-case basis, including heightened scrutiny of environmental and water management, and the capability of robust ongoing regulatory oversight.<sup>167</sup>

As the development of renewable energy technologies increasingly accelerate, the discussion on the advancement of renewables has also become progressively nuanced. After decades of social and environmental consequences from conventional, large-scale hydropower and geothermal projects, it is now well recognized that conventional renewable energy technologies can be carbon and resource intensive.<sup>168</sup> This might explain why the EIB has applied its emission standard even to conventional renewable energy projects.

The social and environmental consequences from conventional, large-scale hydropower and geothermal projects need not be belabored.

- ⊙ **These projects cause severe and often irreversible damage to the integrity of ecosystems.** They disrupt the balance of

ecosystems; interrupt the flow of rivers and sediments causing coastal erosion; and impose stress on freshwater species. Since 1970, freshwater ecosystems have on average lost 76% of their population due to dam building and other factors.<sup>169</sup>

- ◉ **Host and neighboring communities, which frequently are indigenous peoples opposing these projects, often experience violations of their rights to their lands, territories, resources, governance, cultural integrity and free, prior and informed consent.** According to a Director of the Sunrise Project, large hydropower projects have displaced at least 40-80 million people and have negatively affected an estimated 472 million people living downstream.<sup>170</sup>
- ◉ **These projects also exacerbate the vulnerability of water and energy systems to climate change.** Due to unprecedented heavy rainfall, dams are collapsing, fragile mountain areas are flooded, and people and animals are displaced.<sup>171</sup> Due to these impacts, over 321 civil society organizations from 53 countries have called on governments, financiers and other institutions to keep large hydropower projects out of their initiatives to address climate change.<sup>172</sup>
- ◉ **Given the expansive space required, and the huge volumes of power expected to be generated and distributed across borders, these projects are often resource-intensive.**<sup>173</sup> Large-scale hydropower projects are usually hundreds of meters high and stores millions of hectare-meters of water.
- ◉ **Large hydropower projects have been dubbed as “methane factories” and “methane bombs”** as scientific studies indicate that their methane emissions can vary dramatically—from a small fraction compared to coal-fired power plants in northern subarctic climates, to a large fraction in more temperate climates like much of the U.S. and Europe, and to significant amounts

in tropical regions.<sup>174</sup> In fact, a study showed that methane—a greenhouse gas more than 20 times more potent than CO<sub>2</sub>—from hydro reservoirs accounts for more than 4% of all human-caused climate change.<sup>175</sup>

In view of this, the IPCC Special Report on Global Warming of 1.5°C in fact categorizes hydropower and geothermal, without mention of scale and size, as “other renewables”. In 1.5°C modelled pathways, these other renewables will have negligible growth unlike solar and wind.<sup>176</sup>

ADB also recognizes that large-scale hydropower and geothermal power projects can be carbon-intensive. Thus, in its list of activities eligible as climate finance, geothermal power and hydropower projects are eligible only if *net emission reductions can be demonstrated*.<sup>177</sup>

In recognition of the harmful impacts of these projects, ADB's 2009 Energy Policy also imposes environmental and social safeguards such as (i) robust mitigation strategies; (ii) adequate disclosure and consultation with the affected people; (iii) enforcement of environmental safeguards, including policy dialogue; and (iv) proper resettlement and economic rehabilitation of the affected people.<sup>178</sup>

Despite these safeguard policies, however, ADB has funded large hydropower projects that have faced several strong oppositions from affected host communities and civil society organizations such as 290MW Nam Ngiep 1 Hydropower Project in Lao PDR, Upper Trishuli 1 Hydroelectric Power Project (No. 49086-001), the Nenskra Hydropower Project (No. 49223-001), and the Tina River Hydropower Project (No. 50240-001).<sup>179</sup>

Ensuring that its energy policy no longer allows for the financing of carbon and resource-intensive renewable energy technologies is also a critical reason to update the ADB's 2009 Energy Policy.

## **NAM NGIEP 1 HYDROPOWER PROJECT in Lao People's Democratic Republic (Lao PDR): The Drawbacks of Large-scale Hydropower Projects<sup>180</sup>**

In 2014, ADB approved the 290 MW Nam Ngiep 1 Hydropower Project in Lao PDR in the Greater Mekong Subregion (GMS). Lao PDR has the highest hydropower potential in the region at 20,000 MW, but coupled by the smallest domestic demand. ADB's assistance entails financing (up to 50 million USD) and guidance on the possible environmental and social implications to Nam Ngiep 1 Power Company.<sup>181</sup>

### **Inevitable Losses**

The project aims to utilize Lao PDR's large hydropower potential as an opportunity for trade, economic growth, and foreign exchange to fellow countries in the GMS such as Thailand. The project also aims to augment the domestic electrification rate, from 82% to 92% by 2024. Supposedly under ADB's guidance, the project shall reflect best practice in addressing social and environmental impacts. Subsequently it urges further investment into such infrastructure development. The hydropower plant claims consistency with the 2009 Energy Policy through the development of renewable energy sources, increased power supply, and best practice in the implementation of the project.<sup>182</sup>

However, the project has not proceeded without incurring losses in biodiversity and reduction of environmental service potential due to mass earth moving and construction of necessary infrastructure.<sup>183</sup> There were other environmental impacts such as siltation and water pollution. Though the Environmental Impact Assessment (EIA) prepared by Environmental Resource Management<sup>184</sup> proposed mitigation procedures to minimize impacts, major alterations in landform, flow, and access may still have noticeable impact on biodiversity, water quality, and socio-economics. A study by Swedish Society for Nature Conservation found that fragmented habitats may isolate species, and prevent the flow of nutrients, and limit migration.<sup>185</sup> Despite the use of best practice towards mitigation, there are cases where major alterations are inevitable.

### **False Solution**

A country that has abundant water resources such as Lao PDR could benefit from diversifying its electricity supply. River-based ecosystems can be saved and dependence on water resources can be reduced. Despite the potential of hydropower to boost economies and improve energy security, the threat to the environment, and resident communities and their livelihood become more apparent as hydropower projects continue to be established along the lower sections of Mekong River. Moreover, continuous construction of dams across the river has a cumulative impact on agriculture and fisheries. Adjacent agricultural lands are often converted for the use of hydropower projects and replacement lands are commonly not as productive. Agricultural lands have also become prone to flooding due to hydropower development.<sup>186</sup>

Local fishing techniques and practices have been passed down and developed through generations of fishermen living along Mekong River. These practices have been adapted using the particular flow and dynamics of the river, and thus they will soon become ineffective as the river is subjected to further alteration.<sup>187</sup> "Up to

70% of commercial fish are long distance migratory species. If this fish migration is blocked by large infrastructure such as a hydropower development, fish will not be able to reach spawning grounds.”<sup>188</sup> The further addition of hydropower infrastructure along Mekong River may result to the decline of fisheries, the lifeline of resident communities.

Subsequently, the fish population may decline and put the livelihood of 60 million residents at risk.<sup>189</sup> On the other hand, technological advances such as fish ladders allow fish and other aquatic organisms to traverse the dam infrastructure. However, this technology has its limitations when dealing with diverse species assemblages and mass amounts of migration. Apart from the Mekong River's capacity to facilitate spawning and migration, a free-flowing river has the ability to absorb disturbances brought about by climate change, thus making it more resilient to the impacts.<sup>190</sup>

### **Transboundary Threat**

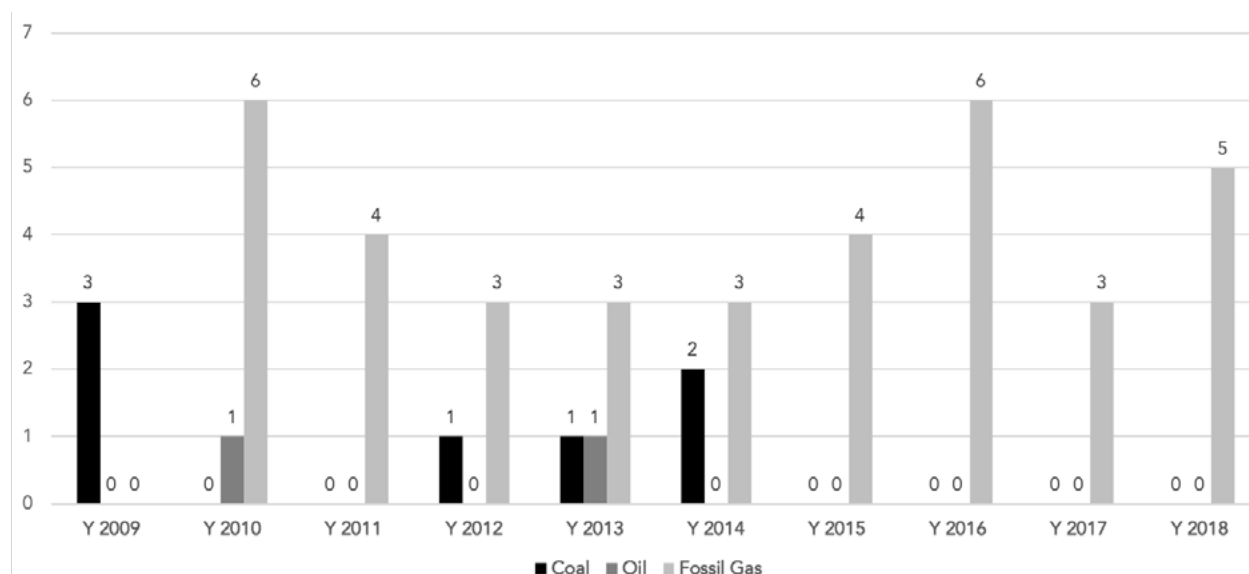
The power plant was commissioned in late 2018 and has since commenced commercial operations in early 2019. The project has resulted to the relocation of more than 430 households, a portion of which are indigenous people, and loss of land by more than 560 households.

Several projects apart from the Nam Ngiep 1 project received backlash from both host communities and neighbouring countries. The Xayanburi Dam in Lao PDR, the first planned hydropower dam on the Lower Mekong Mainstream, received strong opposition from the host community and Thai villagers that share the Mekong River. Various concerns were also brought up the Cambodian and Vietnamese governments. In their petition the communities stated, “since energy is part of the agenda during this important meeting, we would like to inform you that the Mekong is the bloodline, the life, the spirit and the culture of at least over sixty million people.”<sup>191</sup> Furthermore, they expressed their fear that the dam may worsen flooding. Also, it may facilitate further decline of fisheries and as a result, indirectly force residents off their lands.

## **FOSSIL GAS BRIDGE**

Under the 2009 Energy Policy, ADB committed to continue to support financing of fossil gas-based power plants because of their environmental benefit without imposing restrictions or a timeline for phasing out fossil gas investments. Reviewing the Bank's power generation projects, it has in fact invested more on fossil gas projects compared to coal and oil projects.

**Figure 14**  
**FOSSIL GAS, COAL, AND OIL GENERATION PROJECTS FUNDING TREND (2009-2018)**



Source: ADB, *Projects*, <<https://www.adb.org/projects>>.

In the context of the climate emergency, fossil gas is the preferred alternative for coal and oil since it is the “cleanest” among fossil fuels, which can serve baseload demand. It is dubbed as a transition or bridge fuel that will assist in meeting rising energy demand during the low-carbon transition. While serving as a bridge fuel, renewable energy technologies are expected to further mature and decline in costs.

Discussion on fossil gas as a transition fuel started during a time when fossil gas was cheaper than renewable energy alternatives. Today, according to the International Renewable Energy Agency’s Renewable Power Generation Costs Report, there are renewable energy technologies that are already cost competitive with fossil gas. At this juncture then, ADB should focus its financial flows to expediting renewable energy exploration and development towards long-term climate solutions and should leave financing for fossil gas projects to other investors.

However, should the ADB insist on financing fossil gas projects as a bridge fuel, it should likewise set of strict criteria based on a low-carbon transition to ensure that these are purposive transition projects that do not operate beyond what climate science allows. The criteria should

include the term of the project, a long-term plan to transition to low-carbon gases, meeting a specific emission performance standard, and an assessment of the project’s economic viability compared to rapidly deflating costs of available renewable energy options in its DMC.

EIB provides a good example of a policy on fossil gas as a bridge fuel. Although EIB does not specifically refer to fossil gas as a bridge fuel, it appreciates the necessary role that fossil gas will play to decarbonize energy systems. EIB is specifically looking into fossil gas technologies that can be progressively replaced by low-carbon gases such as biogas, synthetic gas, and hydrogen.<sup>192</sup>

Thus, EIB allows financing for fossil gas projects only under three circumstances:

1. Projects already formally under appraisal until the end of 2021;
2. Projects in the 4<sup>th</sup> PCI list co-financed with EU budget; and
3. For power plant projects progressively increasing the share of low-carbon gases, the emission standard can be met on average over the plant’s economic lifetime.<sup>193</sup>

## ADB's Latest Fossil Fuel Project

In 30 October 2018, ADB approved its latest fossil fuel project located in the WHA Eastern Seaboard Industrial Estate (formerly known as Hemaraj Eastern Seaboard Estate) of Chonburi Province. The project necessitates the construction and operation of a 2,500 MW combined-cycle power plant. The whole project would require a loan up to 228 million USD to Gulf SRC Company Limited (Gulf SRC).<sup>195</sup>

The project is the fourth-largest power plant and the largest combined-cycle power plant in Thailand. It has the objective of providing significant generating capacity that is reliable, efficient, and cost-effective to the domestic grid. The supposed maximum rated efficiency of the proposed technology is 63%.<sup>196</sup> “Increased capacity for power generation is essential for rapidly growing countries like Thailand as energy demand will continue to rise,” said ADB Deputy Director General for Private Sector Operations Mr. Christopher Thieme.<sup>197</sup> “ADB’s financing of Gulf SRC will support the creation of a cleaner and more affordable source of energy generation in Thailand”, he continued.<sup>198</sup>

This initiative was also deemed necessary to match the projected growth of the industrial sector under the Eastern Economic Corridor (EEC) program. Policy wise, the project claims consistency with ADB’s Energy Policy, “which emphasizes investments in energy efficiency, least-cost supply, and private sector participation.”<sup>199</sup>

### ***Renewable energy not considered***

However, there were no data or arguments presented in the available reports as to why renewable energy sources could not have been a viable option. Focus on the financial and technological viability of the combined-cycle power plant was thoroughly discussed yet there were no mention of potential alternatives apart from coal, important for consideration. The project was touted to be the primary alternative from the conventional coal-fired power plants with lower costs and fewer emissions. Given the technological advances and ADB’s financing framework geared towards promoting renewable energy sources, said sources could have served as a better alternative to the combined-cycle power plant. Renewable energy sources could have provided far better financing options while producing cleaner and a more sustainable supply of energy.

The Environmental and Social Impact Assessment prepared by Gulf SRC for ADB revealed that the criteria used in the selection of the appropriate technology takes into account the location, type of fuel and technology. The location of the project was conveniently near an existing natural gas pipeline of the Petroleum Authority of Thailand (PPT) Co., Ltd. (Public). Additionally, the project location is near the electricity transmission line of the Electricity Generating Authority of Thailand.

In terms of fuel, comparative analysis was only conducted between natural gas and other fossil fuels such as oil and coal. Lastly, discussion on technology selection only revolved around the potential of a combined cycle power plant. Overall there was no analysis of renewable energy potential in the proposed site, no analysis of renewable energy-based generation versus natural gas-based generation, and there was no analysis of any renewable energy technology potential despite its rapid advancements.<sup>200</sup>



**Not for transition**

Although natural gas is currently being considered as a transition fuel, this project was evidently not intended for such purpose. The project is expected to become fully constructed and operational by 2022, just in time to replace aging power plants in Thailand. With this, Thailand plunges further into natural gas reliance. The power plant will be utilized for at least 25 years, supplying for Electricity Generating Authority of Thailand (EGAT) and PPT Public Company Limited (PTT).

Due to various concerns brought about by Thailand's gas reliance, social protest movements have been formed against infrastructure developments such as the Trans Thai-Malaysia Gas Pipeline in Southern Thailand.<sup>201</sup>

**WEANING OFF FALSE SOLUTIONS**

Currently, global efforts still fall short of meeting the Paris goal. As we come to a critical point in the climate race, there should no longer be any excuses for burning fossil fuels. It is crucial to stay on track and to wean off false solutions. For the ADB, its 20019 Energy Policy still leaves room for finances to flow into false solutions such as (1) carbon capture and storage technologies, and (2) energy efficient fossil fuel technologies.

**CARBON CAPTURE SCAM**

ADB's 2009 Energy Policy encourages its DMCs to adopt "available cleaner technologies" such as CO<sub>2</sub> or carbon capture and storage (CCS).<sup>202</sup> This policy is echoed in the Joint MDB Approach for Climate Finance Tracking and the Common Principles for Climate Finance Tracking, where CCS is considered as a non-energy GHG reduction activity.<sup>203</sup>

CCS is a process consisting of the separation of CO<sub>2</sub> from industrial and energy-related sources, transport to a storage location and long-term isolation from the atmosphere.<sup>204</sup> In some cases, the carbon captured may be stored in geological formations, in the ocean, in mineral carbonates, or may be used in industrial processes.<sup>205</sup>

**In the context of the 10-year race and the IPCC's call for unprecedented system change, CCS comes as a scam and a distraction that cannot save the climate.**<sup>206</sup> CCS technology is founded on the premise that human activities can still involve burning of fossil fuels without the harmful effect of global warming. This con-

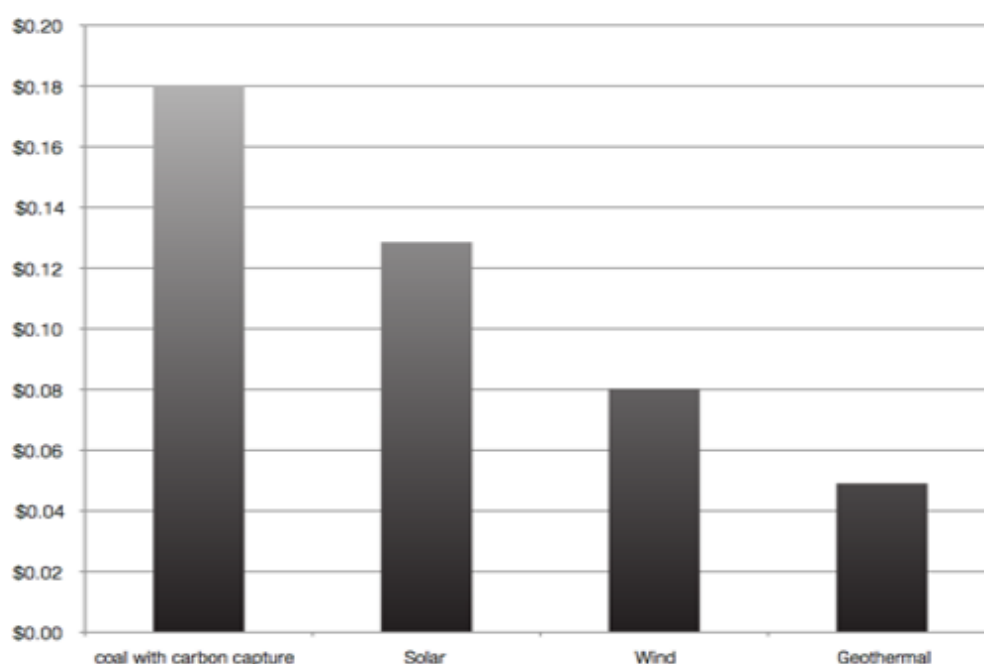
tradicts the crystal clear and strong call for the phase-out of fossil fuels **by allowing the burning of fossil fuels for as long as they are accompanied by CCS.**

Moreover, it has been exposed before that CCS has a corollary market opportunity, that is "enhanced oil recovery" (EOR). When CO<sub>2</sub> is injected underground, it forces out oil that otherwise could not be extracted. Thus CCS can be used for EOR. Ironically, study claims that when CCS is done complementarily with EOR, the series of activities involved—from mining coal, capturing carbon from the coal plant, utilizing the carbon for EOR, and burning the produced oil—will result to a net increase in carbon emissions. **Thus, promoting CCS will not only make compromises for some fossil fuel projects, but for a series of fossil fuel-related activities resulting in more GHG emissions.**<sup>207</sup>

**CCS technology is also in its development stage and is still extremely costly.** In the United States, "the US Energy Information Administration, part of Department of Energy which has invested billions of dollars in CCS, show that CCS is the most expensive method of avoiding additional CO<sub>2</sub> emissions"<sup>208</sup>. This is confirmed by Greenpeace USA's survey of the relative costs of avoiding a kilogram of CO<sub>2</sub> emissions per kilowatt hour, which shows that CCS would cost almost 40% more per kilogram of avoided CO<sub>2</sub> compared with solar PV, 125% more than wind, and 260% more than geothermal.<sup>209</sup>



**Figure 15**  
**RELATIVE COSTS OF AVOIDED CO<sub>2</sub> (per kilogram per kWh)**



*Source: Greenpeace USA, 2015*

**Finally, there is no need to make compromises for fossil fuels when the IPCC Special Report on Global Warming of 1.5°C provides a 1.5°C model pathway without CCS.** In what is called a P1 Scenario, the 1.5°C Paris goal is achieved through a downsized energy system, which enables rapid decarbonization of energy supply, and with afforestation as the only Carbon Dioxide Removal (CDR) option<sup>210</sup> considered. Neither fossil fuels with CCS nor bioenergy with CCS are used.<sup>211</sup> Thus, a full fossil fuel CCS is not necessary to achieve the 1.5°C Paris goal.

### **PROMOTING AND SCALING UP CARBON CAPTURE IN PEOPLE'S REPUBLIC OF CHINA: Undermining Renewable Energy Solutions<sup>212</sup>**

In 2017, ADB approved the project 'Promoting and Scaling Up Carbon Capture and Storage Demonstration' with the intent to provide knowledge and technical support to People's Republic of China (PRC). This entails the development of carbon capture, utilization, and sequestration (CCUS) as a solution to the growing problem that is climate change. The technical assistance cluster of ADB has incurred a total investment of 5.5 million USD.

#### **Nearing Deadlines**

The project was established as a response to the immediate need to curb carbon dioxide (CO<sub>2</sub>) emissions. "To meet its nationally determined contributions in line with the Paris Climate Agreement of 2015, the PRC has committed to achieve peaking of CO<sub>2</sub> emissions and decrease its carbon intensity by 60%–65% from its 2005 levels by 2030."<sup>213</sup> The PRC's energy supply is heavily reliant on fossil fuel resources (85%).

To further augment its CO<sub>2</sub> emissions, PRC aims to increase the share of renewable energy to 20% by 2030. CCUS however is currently touted to be the “only available near-commercial technology that can abate 90% or more of CO<sub>2</sub> emissions from fossil-fuel-based industrial and power plants”<sup>214</sup> So much so that PRC has streamlined CCUS development through its national High-Tech Development Program and other development partners. As a result, 14 projects involving carbon capture and CO<sub>2</sub> sequestration technologies have been established. PRC has invested a total of 447 million USD in said projects.<sup>215</sup>

### Climate Change Mitigation

Despite mention of the importance of diversifying energy supply in curbing CO<sub>2</sub> emissions, the vision for PRC's energy sector remains shallow. The share of renewable energy by 2030 was set at just 20% while other countries aim to totally phase-out fossil fuel-based energy generation. In light of the global movement to decarbonize by 2030, PRC and ADB continue to fund reactive solutions instead of proactive solutions that attack the source. Taking into account the most recent report of the Intergovernmental Panel on Climate Change (IPCC) on Global Warming of 1.5, each country should be more stringent and aggressive with regards to their mitigation efforts. More so than what's committed back in the Paris agreement, in an effort to prevent irreversible impacts by 2030. Totally switching to renewable energy would not only curb CO<sub>2</sub> emissions, but would also serve as a more viable alternative to fossil fuels. PRC also runs the risk of incurring stranded assets amidst the growing investment value of renewable energy.

### Carbon Capture Boosts Fossil Fuels

PRC's investment on carbon capture could have yielded more economic value and facilitated greater mitigation potential if it was put into developing the renewable energy industry. According to Greenpeace, “carbon capture and storage (CCS) technology is much more expensive than wind and solar. It also represents a perverse subsidy to the fossil fuel sector that will only boost coal and oil, and delay the transition to a renewable energy system.”<sup>216</sup> CCS facilitates a positive feedback loop for the fossil fuel industry to consume more resources and produce more harmful emissions. “Carbon capture could actually increase the overall climate pollution associated with fossil fuels by promoting increased extraction, combustion, and fugitive emissions.”<sup>217</sup>

With regard to economic viability, a US Energy Information Administration (USEIA) report reveals that CCS is 40% more expensive than solar photovoltaic, 125% more than wind, and 260% more than geothermal. The potential of renewable energy to mitigate carbon emissions will continue to exceed CCS as the cost of renewable energy falls. “Its price tag is further evidence that our focus should be on moving toward affordable renewable energy, not wasting time with false solutions.”<sup>218</sup>

## ENERGY EFFICIENT FOSSIL FUEL PROJECTS

As discussed in Chapter 2, energy efficiency is one of ADB's many justifications for financing coal and other fossil fuel projects. Regardless of whether these newer technologies still emit large emissions of GHGs compared to other

renewable energy technologies, ADB's Policy allows financing for fossil fuel projects if they adopt “cleaner” or more accurately put less dirtier technologies compared to conventional ones. Under the current policy, energy efficiency improvements and co/tri-generation projects may also be funded.

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

Comparing newer and more efficient fossil fuel technologies with older technologies is another false solution that has diverted much-needed finances from real solutions that do not involve burning of fossil fuels altogether. ADB can simply follow suit from the EIB which has effectively weaned off this false solution.

EIB no longer considers any power generation projects and co/tri-generation projects under its energy efficiency component or any other core component. Under energy efficiency, EIB only considers three sectors: buildings, public lighting projects, and industrial facilities and SMEs. Additionally, it adopted a stringent and across the board emission standard that will exclude all fossil fuel projects except for fossil gas under certain exemptions.<sup>219</sup>

### BANKABLE COMMUNITY MICROGRIDS AS ALTERNATIVES

One of the emerging options among DMCs for available energy choices is distributed renewable energy systems also called community microgrids. New small-scale renewable energy technologies are often described as disruptive because they are reshaping the power sector at a rapid pace. With deflating costs for small-scale renewable energy technologies, consumers can now produce their own electricity—giving rise to the term “prosumers”.

Civil society has taken this concept further and explored how these new technologies can not only disrupt the power sector but also empower communities. When communities own and manage their own decentralized, renewable energy systems and distribute the shared electricity among themselves, the microgrid system becomes even more affordable. Through community microgrids, communities can play an increasing role in advancing both energy transformation and energy security.

EIB supports the important role of community microgrids, which it calls “energy communities”. In appraising projects, energy communities will be considered as having high contribution to its policy of securing enabling infrastructures for the integration of renewable energy. While it acknowledges that these are new investment opportunities with capital investment needs that are difficult to estimate, it is important that these infrastructures are supported financially. To cushion financial risks, EIB expects to support such projects using appropriate financing solutions, potentially supported by EC risk-sharing mandates.<sup>220</sup>

Although the ADB already funds a number of community-based renewable energy projects, this is an opportunity for the Bank to prioritize and upscale targets for community microgrids.

## BANKING ON COMMUNITY MICROGRIDS IN THE PHILIPPINES

As an archipelagic country, the Philippines often face challenges with grid extensions and interconnectivities. Community microgrids are becoming a prominent and effective alternatives in providing clean, affordable, and accessible electricity, especially among unelectrified and remote households, small island grids, and impoverished communities.<sup>221</sup>

Several civil society organizations and even private corporations are already establishing microgrids in unelectrified communities. To showcase that community microgrids are bankable, the case for community microgrids in the Philippines is edifying. In partnership with the government, business sector, or even civil society, ADB may pursue a national electrification initiative in the Philippines, specifically through the utilization of renewable energy microgrids.

To provide context, the Philippine Power Mix is dominated by fossil fuels at 69.78%—comprised of coal at 37.31% and other fossil fuels at 32.47%.<sup>222</sup> Although ADB has mostly funded renewable energy projects in the Philippines, when considered in

terms of installed capacity, ADB's legacy in the power sector is mostly on coal and geothermal projects—the 200MW Visayas Base-load Coal Power Project, the 234 MW Tiwi Geothermal Plants, and 442 MW Makban Geothermal Plants.

Despite fossil fuels being the dominant fuel for power generation, over 2.4 million households remain void of electricity access proving that 'energy access for all' requires a more adaptive and innovative approach to power generation and distribution, especially for an archipelago.

Microgrids based on renewable energy can bridge the gap and provide connection to unelectrified and remote households, small island grids, and even impoverished communities. When community microgrids projects aggregated into one project or initiative, it has the potential to become profitable and attractive investments that would achieve goals of accessibility, affordability, and sustainability.

### ***Estimated total power demand***

In the context of the Philippines, communities that are unelectrified are mostly located in remote areas and small islands. To maximizing energy access for all, ADB's investment on microgrids projects in the Philippines may start with a national electrification initiative through community microgrids.

There are a total of 2,460,244 unelectrified households in the Philippines. Based on annual consumption per household per region, these unelectrified households have a total annual demand of 2,387,905.118 MWh (Annex G).

On average, a household in NCR will potentially have a monthly electricity bill of ~Php 1,991/month. High electricity rates are attributed to large imports of fuels, pass-on charges, expensive fossil fuel-based generation, and monopoly in the energy industry among others.

Community microgrids can provide the needed capacity without applying unnecessary charges that burden consumers and while using renewable energy. If this total demand is supplied by solar PV panels, the millions of unelectrified households will need approximately 231,218.12 300 Wp solar PV panels, which will cost approximately Php 127 billion (Annex H).

### ***Accessing the Renewable Energy Trust Fund***

ADB can provide policy-based and investment support to the microgrids initiative through a sovereign financing, particularly by providing a grant to the Renewable Energy (RE) Trust Fund.

ADB can provide both technical and financial assistance grant to the Philippines in pursuit of projects such as this national electrification initiative through community microgrids. Technical assistance will be focused on assisting the Philippines, specifically the Committee constituted to administer the Renewable Energy Trust Fund under the Renewable Energy Law<sup>223</sup>, to formulate a mechanism for accessing the fund. Assistance should be streamed to local government units, communities, or organizations seeking to establish renewable energy microgrids to unelectrified households.

Meanwhile, financial assistance may be in the form of grants since the RE Trust Fund's Guidelines provides that the trust fund may be sourced from contributions, grants, and donations.<sup>224</sup>

This grant may be likened to the European Union's recent joint undertaking with the Department of Energy under the Access to Sustainable Energy Programme (ASEP). Under the ASEP, the EU allocated a grant of over Php 3 billion to assist the Government of the Philippines to meet its rural electrification targets by means of renewable energy, and to promote energy efficiency. However, instead of entering into a partnership with the Philippine Government, ADB may simply provide a grant to the RE Trust Fund, which already has guidelines anchored on advancing renewable energy in the Philippines.

This will also complement the People's Survival Fund under Climate Change Act of 2009, which focuses on financing adaptation programs and projects based on the country's national strategic framework<sup>225</sup>, and providing support and financing to the Government in order to address the problem of climate change, through the People's Survival Fund (PSF).

### ***Accessing financing intermediaries or facilities***

ADB may also provide non-sovereign loans to financing intermediaries or facilities. There are already financing intermediaries specifically focused on advancing community microgrids in certain countries in Developing Asia. ADB may provide loans to these financing intermediaries or facilities to provide financing for renewable energy microgrids projects.

For instance, in India, the Microgrid Investment Accelerator (MIA), an energy access financing facility designed to address challenges in expanding renewable energy microgrids to communities, is already providing concessionary finance to private entities seeking to access new markets and investment opportunities in renewable energy microgrids.<sup>226</sup>





## 4| RECOMMENDATIONS: ADB'S CATALYTIC ROLE IN ASIA'S ENERGY TRANSFORMATION

### A CATALYTIC ROLE

The challenge for ADB in adopting a new energy policy is to make a critical decision regarding its role in this global energy transformation—whether it will leave the door open for financing for coal and other fossil fuel projects or it will finally phase out financing for coal and other fossil fuels.

As the Bank's legacy for the past decade shows, a policy that is still open to financing coal projects will make the Bank complicit to the carbon-intensive industries driving this climate emergency and disproportionately impacting many of its DMCs. It should also recognize that investments for these projects are likely to take place even without its financing. Thus, leaving the door open for financing for coal and other fossil fuels will only highlight that ADB's primary purpose is not to promote energy security, affordability, or energy for all. Rather, it is to maximize profit from these harmful projects until their final years.

If the Bank finally divests and phases out financing for coal and other fossil fuels, then it will play the catalytic role of leading the financing for Developing Asia's energy transformation. ADB is globally significant financial institution that will become the region's leader in climate financing, building the much needed momentum for divestments or restrictions on coal, and later on other fossil fuels. Surely, ADB, which has com-

mitted to promote clean energy long before the EIB, can adopt a more ambitious energy policy.

As a leader in climate financing, ADB's new energy policy should not only set a clear divestment from coal projects but should also be aligned with the Paris Agreement. This means providing both financial and technical assistances to DMCs towards complying with a 1.5°C pathway without false solutions. Paris-alignment also means having a long-term phase-out plan for other fossil fuels. Specific to power generation, the energy policy should prioritize the promotion of the development and advancement of renewable energy by supporting innovations and enabling infrastructures.

### 1 | PARIS ALIGNMENT WITH A 1.5°C GOAL

**Adopt a Paris-aligned policy, instead of merely setting a clean energy agenda and a climate agenda.** A clean energy agenda or even a climate agenda may not necessarily be a Paris agenda. Clearly, under the “clean” energy agenda of the 2009 Energy Policy, although clean energy investment targets were met for the past decade, a number of large-scale coal power plants and other fossil fuel projects were still financed. This resulted to a carbon-intensive lending portfolio for the Bank.

Meanwhile, under the “climate” agenda of the several joint MDB efforts, although climate fi-

nance was accounted for and reported, the list of mitigation activities still includes coal projects (under specific criteria) and CCS. Although some of these activities reduce GHGs, they may not be congruent with a 1.5°C pathway.

A Paris-aligned energy policy ensures that the entire lending portfolio will only consist of investments that either actively support or do not undermine DMCs' commitments to the Paris Agreement.

**A Paris-aligned policy should pursue and promote a 1.5°C Pathway—reaching a global CO<sub>2</sub> emissions decline of 45% from 2010 levels by 2030, and a net-zero CO<sub>2</sub> emissions by mid-century—without false solutions.<sup>227</sup>**

While the IED recommends emphasizing climate change mitigation and adaptation as a core priority and alignment with the Strategy 2030 which refers to the Paris Agreement, it's important to specifically and clearly state the 1.5°C Paris temperature goal.

Developing Asia's pivotal situation as the last bastion of coal and also among the most climate-vulnerable countries warrants that the ADB take a firm and stringent stand on pursuing a 1.5°C pathway, in order to avoid high-carbon lock-in and the risk of stranded assets in the future.

The P1 Scenario outlined in the IPCC's Special Report on Global Warming of 1.5°C eliminates false solutions, while ensuring that the 1.5°C temperature goal is met. ADB should also work with experts in identifying investment opportunities for renewable alternatives that are consistent with this goal.

**Country partnership strategies (CPS) should also be updated to ensure alignment with the Paris Agreement, and projects should be screened in accordance with CPS and national decarbonization pathways.<sup>228</sup>** As the primary platform for designing ADB operations towards delivering development results at the country level, existing CPS should be reviewed and updated in order to mainstream climate change considerations, specifically incorporating the 1.5°C goal.

These updated CPS would require ADB to up-scale its assistances—first, its technical assistance to DMCs in order to enable them to formulate more ambitious and 1.5°C-compliant NDCs and long-term low GHG emission development policies and decarbonization pathways; and second, its financial assistance to DMCs in order to ensure that necessary funding for projects under a 1.5°C pathway is provided. Accordingly, projects should be screened in accordance with its alignment with a DMC's CPS or national decarbonization pathway.

**In view of ADB's increased non-sovereign funding, ADB should also identify NDC-related opportunities for private actors.** In its latest Private Sector Operations Report, ADB reported an increase in its non-sovereign or private sector operations both in terms of projects and funding increased. In terms of climate funding, ADB exceeded its 2017 target of \$1 billion in annual climate financing approvals by 40%.<sup>229</sup> ADB should go beyond these targets and help identify potential investment opportunities associated with NDCs and encourage private investments in these opportunities.<sup>230</sup>

**Use and report more systematically on the impacts of its climate finance.** Adopting the joint MDB approach on climate financing and GHG accounting, ADB should first set targets consistent with the 1.5°C temperature goal. Regular reporting should include not only climate financing but also data on gross emissions and emission reductions associated with the mitigation finance, per project, and aggregated at a country and/or sectoral basis (and for the power sector, relative emissions per installed capacity or generation).<sup>231</sup>

## 2 | DECARBONIZE ENERGY SUPPLY

**Declare a full commitment to divest from all coal mining and power projects and other coal infrastructures—including but not limited to (i) coal mined for captive use of a power plant, (ii) projects considered energy efficient, adopting a carbon capture storage, other mitigating measures, and (iii) projects using co/tri-generation technology.**



ADB should once and for all stop financial flows to projects that allow for the burning of coal—the single largest contributor to the climate crisis. Other private banks, financial institutions, insurers, and reinsurers have made the same commitment as they consider coal as an obvious stranding asset. Development banks which should promote social and economic development above maximizing profits have more reason to divest given the impacts of the climate crisis to sustainable development. EIB has taken the lead among MDBs, ADB should follow suit.

**Systematically account for GHG emissions on a project-level towards screening other carbon-intensive projects through a stringent emission performance standard for all power generation and CHP projects.** ADB should focus its limited resources on meeting the low-carbon transition. EIB commits to do this by imposing a stringent emission performance standard of 250 gCO<sub>2</sub>/kWh for all power generation projects and heating and cooling projects. ADB can set its own emission performance standard, starting with reviewing the emission performance of energy projects in its DMCs, and determining the standard that will effectively phase-out investments in other fossil fuels in the region. This of course can only be done through systematically accounting for GHG emissions during project appraisal.

**Emission performance standards should be applied to all power projects, including renewable energy projects.** Currently, ADB monitors whether a power project's GHG emissions exceeds its GHG reductions. These activities should not be counted as climate mitigation. Instead of simply monitoring emissions against reductions, applying an across-the-board emissions performance standard will ensure that even carbon-emitting projects such as some conventional hydropower and geothermal projects are no longer funded.

**Impose a shadow carbon price of at least USD 80/tCO<sub>2</sub> by 2020 and USD 100/tCO<sub>2</sub> by 2030, coupled with a faster and higher rate of increase.** ADB's carbon price of USD 36.30/tCO<sub>2</sub> is in the bottom range or among the lowest

carbon prices currently imposed by financial institutions. Its rate of increase at 2% per annum in real terms, as well as adjusted for inflation, is also slower than that of other MDBs like EIB and World Bank.

According to the 2017 Report of the High Level Commission on Carbon Prices, the explicit carbon-price level consistent with achieving the Paris 2°C temperature target is at least USD 40–80/tCO<sub>2</sub> by 2020 and USD 50–100/tCO<sub>2</sub> by 2030, provided a supportive policy environment is in place.<sup>232</sup> To meet the 1.5°C Paris temperature goal, ADB should impose carbon prices **at least** at the highest end of the range and also determine a faster and higher rate of increase of its carbon prices, much like how EIB has already determined its increasing carbon prices until 2050.

**Set out strict exclusion criteria for fossil gas projects if determined to be a necessary and economically viable bridge fuel for a DMC's low-carbon transition.** The IPCC's SR1.5 provides a strict timeline for the drastic reduction of fossil gas projects under the P1 Scenario: -25% from 2010 level by 2030, and -74% from 2010 level by 2050. If the circumstances of a country warrant the operation of a fossil gas power plant as a bridge fuel towards reaching the net zero CO<sub>2</sub> emissions by 2050 and ADB insists on financing such project, the Bank should adopt strict exclusion criteria to ensure that these are purposive transition projects that do not operate beyond what climate science allows.

Projects that should be excluded are: (1) projects without a long-term plan to transition to low-carbon fuels such as biogas, synthetic gas, or hydrogen; and (2) projects which cannot comply with the strict emission performance standard, which may be averaged during the lifetime of the projects, similar to the EIB's criteria for fossil gas projects. ADB should likewise assess the project's economic viability compared to rapidly deflating costs of available renewable energy options in its DMC.

**For existing coal projects and other carbon-intensive projects, a clear commitment must be made towards a rapid phase-out**

**starting with the adoption of an ambitious transition plan.** Achieving the 1.5°C temperature goal requires not only rapidly pursuing renewable technologies, but also terminating active carbon-intensive operations that are no longer aligned with the Paris Agreement. Regardless of whether the ADB is meeting clean energy or climate finance targets, for as long as it still has active coal and carbon-intensive operations such as hydropower projects with GHG emissions exceeding GHG reductions, it cannot be considered as committed to a swift and just low-carbon transition.

**ADB should provide DMCs' technical assistance to help DMCs strengthen institutional capacities to formulate just transition policies and strategies.** Although the IED's Sector-wide Evaluation mentions the social implications of decarbonization, it is silent on supporting DMCs formulate just transition policies and strategies. The phase-out of fossil fuel industries towards the shift to low-carbon economies will result to massive workers displacement. In the middle of a pandemic where billions of workers globally are already affected, workers are already facing a high risk of falling into poverty. ADB should assist DMCs in ensuring that workers' rights and interests are upheld by providing technical assistance on formulating just transition policies and strategies.<sup>233</sup> It should also consider creating its own energy transition package, similar to the EIB, which will prioritize funding for reconversion of abandoned coal sites, retraining for displaced workers, and other initiatives that will give rise to new employment opportunities.

### 3 | PROMOTE COMMUNITY MICROGRIDS

**Community microgrids should be prioritized since they maximize energy access, and are increasingly cost-competitive and bankable.** Community microgrids take advantage of the innovative and disruptive nature of new renewables technology. Unlike fossil fuel technologies and large-scale hydropower and geothermal technologies, new renewable energy technologies such as solar PV or pico-hydropower are much smaller in scale and can be owned and managed by communities themselves. If pri-

oritized, access to energy may be expediently provided to unelectrified communities instead of waiting for grid or distribution extensions.

**As the costs of solar and wind technologies have decreased exponentially and have become competitive with fossil fuel technologies, ADB should be looking into community microgrids as attractive investments that are aligned with meeting DMCs' commitments to the Paris Agreement.** Community microgrids may become attractive investments to ADB through aggragation into larger bankable-sized projects, or, if feasible, through being added to main energy sector projects as a special energy access component. This method is in fact already recognized under the 2009 Energy Policy.<sup>234</sup>

### 4 | SUPPORT INNOVATIONS, AND ENABLING INFRASTRUCTURES

**Support funding for innovative renewable energy technologies.** Following EIB's lead, ADB should support funds that support innovative renewable energy technologies. Since funding for early development technologies may be scarce, ADB should take the lead in supporting these technologies to further their maturity and cost-competitiveness.

**Prioritize upgrading of existing grids into smart grids with increased capacity, in order to maximize the integration of more variable renewable energy.** Simultaneous with the advancement of community microgrids, priority should also be given to upgrading existing grids into smart grids with increased capacity. Smart grids will enable better forecasting and management of renewable energy variability and uncertainty, meanwhile increased capacity will allow the integration of more electricity generated from renewable energy systems.

**Support other energy infrastructures such as gas and district heating and cooling networks for low-carbon gases.** In the low-carbon transition, new energy infrastructures are needed for low-carbon gases. Other energy infrastructures that will enable the energy transition should be supported.

## ANNEXES

**Annex A**  
**Newly Operating Coal Plants in Developing Asia by Country, 2009-2018 (MW)<sup>235</sup>**

| Country             | 2009          | 2010          | 2011          | 2012          | 2013          | 2014          | 2015          | 2016          | 2017          | 2018          | Total<br>(2009-<br>2018) | Average<br>(2009-<br>2018) |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------------------|----------------------------|
| China               | 60,733        | 63,856        | 62,861        | 52,209        | 51,707        | 38,697        | 65,417        | 47,545        | 35,115        | 34,514        | 512,654                  | 51,265                     |
| India               | 5,672         | 12,195        | 15,160        | 17,961        | 18,388        | 20,643        | 21,130        | 18,715        | 8,618         | 7,720         | 146,202                  | 14,620                     |
| Indonesia           | 351           | 646           | 4,695         | 4,045         | 2,024         | 1,080         | 2,471         | 1,395         | 1,250         | 480           | 18,437                   | 1,844                      |
| Vietnam             | 520           | 300           | 1,280         | 450           | 1,040         | 3,104         | 4,490         | 150           | 2,444         | 1,800         | 15,578                   | 1,558                      |
| Malaysia            | 1,774         | 0             | 0             | 0             | 0             | 0             | 1,080         | 1,000         | 1,000         | 0             | 4,854                    | 485                        |
| Philippines         | 0             | 267           | 349           | 0             | 600           | 82            | 585           | 1,314         | 465           | 570           | 4,232                    | 423                        |
| Pakistan            | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 40            | 2,260         | 660           | 2,960                    | 296                        |
| Laos                | 0             | 0             | 0             | 0             | 0             | 0             | 1,252         | 626           | 0             | 0             | 1,878                    | 188                        |
| Thailand            | 0             | 85            | 0             | 660           | 0             | 0             | 0             | 0             | 0             | 0             | 745                      | 75                         |
| Cambodia            | 0             | 0             | 0             | 0             | 0             | 235           | 135           | 0             | 135           | 0             | 505                      | 51                         |
| Tajikistan          | 0             | 0             | 0             | 0             | 0             | 100           | 0             | 300           | 0             | 0             | 400                      | 40                         |
| Kyrgyzstan          | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 300           | 0             | 300                      | 30                         |
| Bangladesh          | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 275           | 275                      | 28                         |
| Mongolia            | 0             | 0             | 0             | 0             | 0             | 50            | 125           | 50            | 0             | 0             | 225                      | 23                         |
| Kazakhstan          | 0             | 0             | 150           | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 150                      | 15                         |
| Uzbekistan          | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 150           | 0             | 0             | 150                      | 15                         |
| Myanmar             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 40            | 0             | 40                       | 4                          |
| Hong Kong,<br>China | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0                        | 0                          |
| <b>Total</b>        | <b>69,050</b> | <b>77,349</b> | <b>84,495</b> | <b>75,325</b> | <b>73,759</b> | <b>63,991</b> | <b>96,685</b> | <b>71,285</b> | <b>51,627</b> | <b>46,019</b> | <b>709,585</b>           | <b>70,959</b>              |

*Source: CoalSwarm Global Coal Plant Tracker, January 2019*

## Annex B

### Newly Operating Coal Plants in the Rest of the World by Country, 2009-2018 (MW)

| Country              | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | Total<br>(2009-<br>2018) | Average<br>(2009-2018) |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------------|------------------------|
| United States        | 1,935 | 5,876 | 4,253 | 3,952 | 1,812 | 106   | 50    | 0     | 0     | 0     | 17,984                   | 1,798                  |
| South Korea          | 2,240 | 250   | 123   | 0     | 59    | 1,800 | 0     | 5,341 | 5,262 | 0     | 15,075                   | 1,508                  |
| Germany              | 0     | 85    | 0     | 2,875 | 1,600 | 1,710 | 3,472 | 0     | 0     | 0     | 9,742                    | 974                    |
| Turkey               | 270   | 1,390 | 600   | 0     | 328   | 1,550 | 1,140 | 1,850 | 1,320 | 330   | 8,778                    | 878                    |
| Japan                | 630   | 900   | 0     | 0     | 1,850 | 0     | 0     | 112   | 500   | 597   | 4,589                    | 459                    |
| Russia               | 750   | 0     | 100   | 539   | 50    | 996   | 225   | 1,130 | 0     | 0     | 3,790                    | 379                    |
| Netherlands          | 0     | 0     | 0     | 0     | 0     | 0     | 2,400 | 1,100 | 0     | 0     | 3,500                    | 350                    |
| Taiwan               | 0     | 0     | 50    | 0     | 0     | 0     | 0     | 800   | 800   | 1,600 | 3,250                    | 325                    |
| South Africa         | 0     | 0     | 0     | 0     | 0     | 0     | 794   | 0     | 1,588 | 794   | 3,176                    | 318                    |
| Chile                | 152   | 419   | 709   | 905   | 270   | 0     | 152   | 530   | 0     | 0     | 3,137                    | 314                    |
| Poland               | 560   | 64    | 858   | 0     | 50    | 0     | 55    | 50    | 1,075 | 220   | 2,932                    | 293                    |
| Italy                | 660   | 1,320 | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 1,980                    | 198                    |
| Brazil               | 0     | 414   | 0     | 360   | 1,085 | 0     | 0     | 0     | 0     | 0     | 1,859                    | 186                    |
| Morocco              | 0     | 0     | 0     | 0     | 0     | 700   | 0     | 0     | 350   | 0     | 1,050                    | 105                    |
| Sri Lanka            | 0     | 0     | 300   | 0     | 0     | 600   | 0     | 0     | 0     | 0     | 900                      | 90                     |
| Czech Republic       | 0     | 0     | 0     | 0     | 0     | 135   | 0     | 750   | 0     | 0     | 885                      | 89                     |
| Bulgaria             | 121   | 0     | 670   | 0     | 0     | 0     | 0     | 0     | 53    | 0     | 844                      | 84                     |
| Guatemala            | 0     | 0     | 172   | 60    | 33    | 122   | 0     | 361   | 0     | 0     | 748                      | 75                     |
| Mexico               | 0     | 678   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 678                      | 68                     |
| Canada               | 0     | 0     | 495   | 0     | 0     | 110   | 0     | 0     | 0     | 0     | 605                      | 61                     |
| North Korea          | 0     | 600   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 600                      | 60                     |
| Botswana             | 0     | 0     | 0     | 0     | 300   | 300   | 0     | 0     | 0     | 0     | 600                      | 60                     |
| Slovenia             | 0     | 0     | 0     | 0     | 0     | 0     | 600   | 0     | 0     | 0     | 600                      | 60                     |
| Australia            | 466   | 0     | 0     | 114   | 0     | 0     | 0     | 0     | 0     | 0     | 580                      | 58                     |
| Colombia             | 0     | 0     | 0     | 0     | 0     | 0     | 164   | 160   | 0     | 250   | 574                      | 57                     |
| Zambia               | 0     | 0     | 0     | 0     | 0     | 0     | 30    | 300   | 0     | 0     | 330                      | 33                     |
| Panama               | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 300   | 300                      | 30                     |
| Bosnia & Herzegovina | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 300   | 0     | 0     | 300                      | 30                     |
| Senegal              | 0     | 0     | 30    | 0     | 0     | 0     | 0     | 0     | 0     | 125   | 155                      | 16                     |
| Madagascar           | 0     | 0     | 120   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 120                      | 12                     |
| Honduras             | 0     | 0     | 0     | 0     | 0     | 0     | 70    | 0     | 0     | 0     | 70                       | 7                      |
| Syria                | 0     | 60    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 60                       | 6                      |
| Zimbabwe             | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 30    | 30                       | 3                      |
| Ivory Coast          | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Niger                | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| El Salvador          | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Guinea               | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Latvia               | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Oman                 | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Sudan                | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Jordan               | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Albania              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Belarus              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Belgium              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Spain                | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Romania              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Israel               | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Denmark              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |
| Finland              | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                        | 0                      |

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

|                              |              |               |              |              |              |              |              |               |               |              |               |              |
|------------------------------|--------------|---------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|--------------|---------------|--------------|
| Portugal                     | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Moldova                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Slovakia                     | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Ireland                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Austria                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| New Zealand                  | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Croatia                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Sweden                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Peru                         | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Dominican Republic           | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Montenegro                   | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Swaziland                    | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Georgia                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Venezuela                    | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Jamaica                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| United Kingdom               | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Hungary                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Kosovo                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Greece                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| United Arab Emirates         | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Iran                         | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Ukraine                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| France                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Reunion                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Guadeloupe                   | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Democratic Republic of Congo | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Namibia                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Mauritius                    | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Egypt                        | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Malawi                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Serbia                       | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Mozambique                   | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Nigeria                      | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Tanzania                     | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Kenya                        | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| FYROM                        | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Ghana                        | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| Argentina                    | 0            | 0             | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0            | 0             | 0            |
| <b>Total</b>                 | <b>7,784</b> | <b>12,056</b> | <b>8,480</b> | <b>8,805</b> | <b>7,437</b> | <b>8,129</b> | <b>9,152</b> | <b>12,784</b> | <b>10,948</b> | <b>4,246</b> | <b>89,821</b> | <b>8,982</b> |

### Annex C

#### Retired Coal Plants in Developing Asia by Country, 2009-2018 (MW)

| Country          | 2009          | 2010         | 2011         | 2012         | 2013         | 2014         | 2015         | 2016         | 2017          | 2018         | Undated      | Dated 2009-2018 | All retired (includes dated and undated) | Average (2009-2018 and undated) |
|------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|-----------------|--|---------------------------------|
| China            | 10,048        | 9,117        | 3,714        | 3,479        | 2,973        | 8,861        | 5,828        | 5,075        | 7,106         | 6,714        | 6,375        | 62,915          | 69,290                                   | 6,299                           |
| India            | 120           | 837          | 94           | 62           | 186          | 222          | 484          | 780          | 3,480         | 2,009        | 935          | 8,274           | 9,209                                    | 837                             |
| Thailand         | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 225          | 0               | 225                                      | 20                              |
| Uzbekistan       | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 213          | 0             | 0            | 0            | 213             | 213                                      | 19                              |
| Kyrgyzstan       | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 195           | 0            | 0            | 195             | 195                                      | 18                              |
| Philippines      | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 52           | 0               | 52                                       | 5                               |
| Bangladesh       | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Cambodia         | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Hong Kong, China | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Indonesia        | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Kazakhstan       | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Laos             | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Malaysia         | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Mongolia         | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Myanmar          | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Pakistan         | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Tajikistan       | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| Vietnam          | 0             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0             | 0            | 0            | 0               | 0  | 0                               |
| <b>Total</b>     | <b>10,168</b> | <b>9,954</b> | <b>3,808</b> | <b>3,541</b> | <b>3,159</b> | <b>9,083</b> | <b>6,312</b> | <b>6,068</b> | <b>10,781</b> | <b>8,723</b> | <b>7,587</b> | <b>71,597</b>   | <b>79,184</b>                            | <b>7,199</b>                    |

*Source: CoalSwarm Global Coal Plant Tracker, January 2019*

### Annex D

#### Retired Coal Plants in the Rest of the World by Country, 2009-2018 (MW)

| Country        | 2009 | 2010  | 2011  | 2012   | 2013  | 2014  | 2015   | 2016   | 2017  | 2018   | Undated | Dated 2009-2018 | All retired (includes dated and undated) | Average (2009-2018 and undated) |
|----------------|------|-------|-------|--------|-------|-------|--------|--------|-------|--------|---------|-----------------|--|---------------------------------|
| United States  | 563  | 2,448 | 3,295 | 10,318 | 6,827 | 4,438 | 21,521 | 15,392 | 8,768 | 17,612 | 558     | 91,182          | 91,740                                   | 8,340                           |
| United Kingdom | 0    | 0     | 2,064 | 2,172  | 4,177 | 1,767 | 456    | 5,317  | 360   | 2,833  | 200     | 19,146          | 19,346                                   | 1,759                           |
| Germany        | 0    | 0     | 746   | 2,933  | 1,313 | 2,328 | 1,151  | 680    | 3,350 | 532    | 1,259   | 13,033          | 14,292                                   | 1,299                           |
| Australia      | 0    | 490   | 125   | 905    | 0     | 1,301 | 590    | 760    | 1,840 | 0      | 600     | 6,011           | 6,611                                    | 601                             |
| Canada         | 0    | 1,319 | 980   | 0      | 3,136 | 62    | 0      | 0      | 0     | 560    | 0       | 6,057           | 6,057                                    | 551                             |
| France         | 0    | 0     | 0     | 0      | 1,585 | 516   | 2,058  | 0      | 0     | 0      | 250     | 4,159           | 4,409                                    | 401                             |
| Poland         | 340  | 200   | 225   | 744    | 446   | 380   | 293    | 240    | 600   | 0      | 320     | 3,468           | 3,788                                    | 344                             |
| Spain          | 0    | 0     | 160   | 796    | 590   | 0     | 254    | 529    | 0     | 0      | 0       | 2,329           | 2,329                                    | 212                             |
| Netherlands    | 0    | 0     | 0     | 0      | 0     | 0     | 1,774  | 0      | 1,206 | 0      | 0       | 2,980           | 2,980                                    | 271                             |
| Belgium        | 252  | 457   | 0     | 260    | 590   | 0     | 0      | 560    | 0     | 0      | 0       | 2,119           | 2,119                                    | 193                             |
| Finland        | 0    | 0     | 0     | 0      | 80    | 1,000 | 0      | 0      | 833   | 0      | 100     | 1,913           | 2,013                                    | 183                             |
| Denmark        | 143  | 326   | 0     | 266    | 0     | 0     | 0      | 1,131  | 0     | 0      | 70      | 1,866           | 1,936                                    | 176                             |
| Romania        | 0    | 50    | 0     | 210    | 150   | 0     | 730    | 100    | 0     | 0      | 0       | 1,240           | 1,240                                    | 113                             |
| Italy          | 0    | 0     | 0     | 0      | 0     | 140   | 140    | 660    | 155   | 0      | 0       | 1,095           | 1,095                                    | 100                             |
| Taiwan         | 0    | 0     | 0     | 600    | 0     | 600   | 0      | 0      | 0     | 0      | 0       | 1,200           | 1,200                                    | 109                             |
| Austria        | 0    | 55    | 192   | 0      | 0     | 0     | 450    | 165    | 0     | 0      | 242     | 862             | 1,104                                    | 100                             |
| Bulgaria       | 0    | 0     | 0     | 0      | 210   | 210   | 840    | 0      | 0     | 0      | 120     | 1,260           | 1,380                                    | 125                             |
| Russia         | 0    | 0     | 0     | 0      | 585   | 0     | 688    | 0      | 0     | 30     | 50      | 1,303           | 1,353                                    | 123                             |



## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

|                              |    |     |     |     |     |     |     |     |     |     |     |     |       |     |
|------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|
| Czech Republic               | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 420 | 0   | 0   | 694 | 420 | 1,114 | 101 |
| Sweden                       | 0  | 0   | 0   | 0   | 0   | 150 | 0   | 0   | 0   | 0   | 0   | 150 | 150   | 14  |
| Greece                       | 0  | 70  | 250 | 0   | 33  | 0   | 0   | 550 | 0   | 0   | 0   | 903 | 903   | 82  |
| South Korea                  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 525 | 200 | 0   | 725 | 725   | 66  |
| Slovakia                     | 0  | 220 | 0   | 0   | 32  | 0   | 220 | 0   | 0   | 0   | 0   | 472 | 472   | 43  |
| Slovenia                     | 0  | 30  | 0   | 0   | 0   | 75  | 0   | 0   | 0   | 400 | 0   | 505 | 505   | 46  |
| New Zealand                  | 0  | 0   | 0   | 250 | 250 | 0   | 0   | 0   | 0   | 0   | 0   | 500 | 500   | 45  |
| Brazil                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 446 | 0   | 0   | 446 | 446   | 41  |
| Hungary                      | 0  | 0   | 305 | 110 | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 415 | 415   | 38  |
| Kosovo                       | 0  | 125 | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 125 | 125   | 11  |
| Japan                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 115 | 0   | 115   | 10  |
| Serbia                       | 32 | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 32  | 32    | 3   |
| Zimbabwe                     | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 30  | 0   | 30    | 3   |
| Albania                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Argentina                    | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Belarus                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Bosnia & Herzegovina         | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Botswana                     | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Chile                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Colombia                     | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Croatia                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Democratic Republic of Congo | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Dominican Republic           | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Egypt                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| El Salvador                  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| FYROM                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Georgia                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Ghana                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Guadeloupe                   | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Guatemala                    | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Guinea                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Iran                         | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Ireland                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Israel                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Ivory Coast                  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Jamaica                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Jordan                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Kenya                        | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Latvia                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Madagascar                   | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Malawi                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Mauritius                    | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Mexico                       | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Moldova                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Montenegro                   | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Morocco                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Mozambique                   | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Namibia                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |
| Nigeria                      | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0   |

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

|                      |               |               |               |               |               |               |               |               |               |               |               |                |                |               |
|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|---------------|
| North Korea          | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Oman                 | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Panama               | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Peru                 | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Portugal             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Reunion              | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Senegal              | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| South Africa         | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Sri Lanka            | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Sudan                | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Swaziland            | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Syria                | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Tanzania             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Niger                | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Turkey               | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Ukraine              | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| United Arab Emirates | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Venezuela            | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| Zambia               | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0             | 0              | 0              | 0             |
| <b>Total</b>         | <b>11,498</b> | <b>15,744</b> | <b>12,150</b> | <b>23,105</b> | <b>23,163</b> | <b>22,050</b> | <b>37,477</b> | <b>32,572</b> | <b>28,864</b> | <b>30,890</b> | <b>12,195</b> | <b>237,513</b> | <b>249,708</b> | <b>22,701</b> |

*Source: CoalSwarm Global Coal Plant Tracker, January 2019*

### Annex E

#### Coal Plants in Developing Asia by Region, 2019 (MW)

| Region       | Announced      | Pre-permit     | Permitted     | Announced +<br>Pre-permit +<br>Permitted | Construction   | Shelved        | Operating        | Cancelled<br>2010-2018 |
|--------------|----------------|----------------|---------------|--|----------------|----------------|------------------|------------------------|
| East Asia    | 18,520         | 41,849         | 25,695        | 86,064                                   | 144,937        | 283,725        | 1,094,842        | 462,876                |
| South Asia   | 24,373         | 33,730         | 25,194        | 83,297                                   | 42,098         | 103,061        | 225,205          | 516,857                |
| SE Asia      | 26,695         | 24,046         | 16,188        | 66,929                                   | 29,561         | 40,286         | 73,715           | 72,454                 |
| <b>Total</b> | <b>122,858</b> | <b>135,215</b> | <b>83,098</b> | <b>341,171</b>                           | <b>237,633</b> | <b>481,160</b> | <b>2,023,935</b> | <b>1,273,081</b>       |

Source: CoalSwarm Global Coal Plant Tracker, January 2019

### Annex F

#### Coal Plants in the Rest of the World except in Developing Asia by Region, 2019 (MW)

| Region                 | Announced     | Pre-permit    | Permitted    | Announced +<br>Pre-permit +<br>Permitted | Construction  | Shelved       | Operating      | Cancelled 2010-<br>2018 |
|------------------------|---------------|---------------|--------------|--|---------------|---------------|----------------|-------------------------|
| Africa and Middle East | 30,550        | 6,810         | 5,750        | 43,110                                   | 10,940        | 20,178        | 52,642         | 32,236                  |
| Eurasia                | 1,080         | 4,660         | 0            | 5,740                                    | 1,102         | 2,210         | 85,370         | 14,468                  |
| EU28                   | 3,100         | 5,780         | 0            | 8,880                                    | 6,590         | 0             | 152,415        | 71,739                  |
| Latin America          | 2,060         | 450           | 1,666        | 4,176                                    | 1,605         | 3,735         | 16,968         | 20,527                  |
| Canada/US              | 0             | 0             | 0            | 0  | 0             | 895           | 268,607        | 28,773                  |
| Australia/NZ           | 0             | 0             | 0            | 0  | 0             | 2,516         | 24,942         | 6,440                   |
| <b>Total</b>           | <b>36,790</b> | <b>17,700</b> | <b>7,416</b> | <b>61,906</b>                            | <b>20,237</b> | <b>29,534</b> | <b>600,944</b> | <b>174,183</b>          |

Source: CoalSwarm Global Coal Plant Tracker, January 2019

### Annex G

#### Potential Annual Consumption of Unelectrified Households in the Philippines, Using Current Rates

| Region                     | Total Households <sup>236</sup> | Number of Electrified<br>Households <sup>237</sup> | Number of Unelectrified<br>Households <sup>238</sup> | Annual<br>Residential<br>Consumption in<br>MWh <sup>239</sup> | Annual Consump-<br>tion per Household<br>in kWh <sup>240</sup> | Potential Annual<br>Consumption of<br>Unelectrified House-<br>holds in MWh <sup>241</sup> |
|----------------------------|---------------------------------|--|--|---|--|---|
| CAR                        | 399,700                         | 357,227  | 42,473   | 259,629   | 726.7899683  | 30,868.95032  |
| I- Ilocos Region           | 999,200                         | 992,721  | 6,479  | 844,300   | 850.490722   | 5,510.329388  |
| II- Cagayan Valley         | 804,600                         | 770,496  | 34,104   | 483,474   | 627.4841141  | 21,399.71823  |
| III- Central Luzon         | 1,442,400                       | 1,419,671  | 22,729   | 2,195,467   | 1,546.461821   | 35,149.53073  |
| IV-A- CALABARZON           | 813,000                         | 758,613  | 54,387   | 659,000   | 868.6906235  | 47,245.47694  |
| IV-B- MIMAROPA             | 704,800                         | 563,081  | 141,719  | 303,338   | 538.7111268  | 76,345.60218  |
| NCR                        | 3,512,439                       | 3,451,303  | 61,136   | 11,116,664  | 3,221.004936   | 196,919.3578  |
| V- Bicol Region            | 1,181,600                       | 953,539  | 228,061  | 613,980   | 643.8960546  | 146,847.5781  |
| VI- Western Visayas        | 1,616,600                       | 1,380,928  | 235,672  | 1,183,194   | 856.8107823  | 201,926.3107  |
| VII- Central Visayas       | 1,147,100                       | 1,030,215  | 116,885  | 1,427,250   | 1,385.390428   | 161,931.3602  |
| VIII- Eastern Visayas      | 1,002,100                       | 830,617  | 113,788  | 464,545   | 559.2770194  | 63,639.01348  |
| IX- Zamboanga<br>Peninsula | 754,800                         | 504,732  | 250,068  | 405,394   | 803.1866416  | 200,851.2771  |
| X- Northern Mindanao       | 794,100                         | 684,989  | 109,111  | 670,564   | 978.9412677  | 106,813.2607  |
| XI- Davao Region           | 681,400                         | 470,661  | 210,739  | 972,683   | 2,066.631822   | 435,519.9235  |
| XII- SOCCSKSARGEN          | 1,023,500                       | 655,216  | 368,284  | 639,669   | 976.271947   | 359,545.3377  |

## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

|              |            |            |           |            |              |               |
|--------------|------------|------------|-----------|------------|--------------|---------------|
| XIII- CARAGA | 633,700    | 615,515    | 18,185    | 334,769    | 543.8843895  | 9,890.537623  |
| ARMM         | 587,000    | 198,271    | 388,729   | 146,640    | 739.5937883  | 287,501.5537  |
| Philippines  | 18,098,039 | 15,637,795 | 2,460,244 | 22,720,560 | 17,933.51745 | 2,387,905.118 |

### Annex H Total Demand, and Number and Cost of Solar PV Panels Needed for Unelectrified Households in the Philippines<sup>242</sup>

| Region                  | Number of Unelectrified Households <sup>243</sup> | Estimated Annual Consumption of Unelectrified Households in MWh <sup>244</sup> | Estimated Monthly Consumption of Unelectrified Households in kWh | kWp of Solar PV Panels needed | Number of 300-Wp Solar PV Panels needed | Cost of a complete PV System |
|-------------------------|---|--|--|-------------------------------|---|------------------------------|
| CAR                     | 42,473  | 30,868.95032   | 2,572,412.53   | 22,417.54                     | 2,989.0051                              | P 1,643,952,812.98           |
| I- Ilocos Region        | 6,479   | 5,510.329388   | 459,194.116  | 4,001.692                     | 533.55889                               | P 293,457,386.92             |
| II- Cagayan Valley      | 34,104  | 21,399.71823   | 1,783,309.85   | 15,540.83                     | 2,072.1102                              | P 1,139,660,617.43           |
| III- Central Luzon      | 22,729  | 35,149.53073   | 2,929,127.56   | 25,526.17                     | 3,403.4888                              | P 1,871,918,847.88           |
| IV-A- CALABARZON        | 54,387  | 47,245.47694   | 3,937,123.08   | 34,310.44                     | 4,574.7254                              | P 2,516,098,989.78           |
| IV-B- MIMAROPA          | 141,719   | 76,345.60218   | 6,362,133.52   | 55,443.43                     | 7,392.4572                              | P 4,065,851,483.81           |
| NCR                     | 61,136  | 196,919.3578   | 16,409,946.5   | 143,006.1                     | 19,067.476                              | P 10,487,111,768.58          |
| V- Bicol Region         | 228,061   | 146,847.5781   | 12,237,298.2   | 106,643.1                     | 14,219.083                              | P 7,820,495,565.72           |
| VI- Western Visayas     | 235,672   | 201,926.3107   | 16,827,192.6   | 146,642.2                     | 19,552.293                              | P 10,753,761,402.57          |
| VII- Central Visayas    | 116,885   | 161,931.3602   | 13,494,280   | 117,597.2                     | 15,679.628                              | P 8,623,795,508.11           |
| VIII- Eastern Visayas   | 113,788   | 63,639.01348   | 5,303,251.12   | 46,215.7                      | 6,162.0928                              | P 3,389,151,044.69           |
| IX- Zamboanga Peninsula | 250,068   | 200,851.2771   | 16,737,606.4   | 145,861.5                     | 19,448.199                              | P 10,696,509,552.65          |
| X- Northern Mindanao    | 109,111   | 106,813.2607   | 8,901,105.06   | 77,569.54                     | 10,342.606                              | P 5,688,433,152.75           |
| XI- Davao Region        | 210,739   | 435,519.9235   | 36,293,327   | 316,281.7                     | 42,170.896                              | P 23,193,992,536.92          |
| XII- SOCCSKSARGEN       | 368,284   | 359,545.3377   | 29,962,111.5   | 261,107.7                     | 34,814.363                              | P 19,147,899,853.30          |
| XIII- CARAGA            | 18,185  | 9,890.537623   | 824,211.469  | 7,182.671                     | 957.68943                               | P 526,729,188.35             |
| ARMM                    | 388,729   | 287,501.5537   | 23,958,462.8   | 208,788.3                     | 27,838.446                              | P 15,311,145,440.33          |
| Philippines             | 2,460,244   | 2,387,905.118  | 198,992,093  | 1,734,136                     | 231,218.12                              | P 127,169,965,131.93         |

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- 22 The world clean is placed in quotes since it will be argued in Chapter 3: The Imperative to Decarbonize the ADB that a number of ADB's supposedly clean energy investments have actually resulted in grave and detrimental damage to the health and environment of host communities.
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- 24 See Figure 5.
- 25 In 2014, ADB started reporting the Transport and Information and Communication Technology Sector as two separate sectors—the Transport Sector and Communication Technology Sector. However, for consistency, the two sectors are presented as one combined sector from 2009 to 2017 in Figures 1-3.
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## LEAVING BEHIND ADB'S DIRTY ENERGY LEGACY

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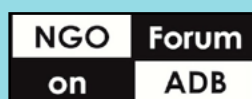
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NGO Forum on ADB  
85-A Masikap Extension, Diliman, Quezon City, Metro Manila  
Philippines  
[www.forum-adb.org](http://www.forum-adb.org)