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HEARING ON

"ASIA'S GROWING HUNGER FOR ENERGY: U.S. POLICY AND SUPPLY OPPORTUNITIES"

BEFORE HOUSE COMMITTEE ON FOREIGN AFFAIRS, SUBCOMMITTEE ON ASIA AND THE PACIFIC U.S. HOUSE OF REPRESENTATIVES SEPTEMBER 8, 2016

Chairman Salmon, Ranking Member Sherman and distinguished members of the Committee, thank you for inviting me to present the Natural Resources Defense Council's (NRDC's) views on Asia's energy opportunities and challenges.

The Asia region is a diverse region with a huge opportunity to spur more renewable energy and energy efficiency deployment and reduce the greenhouse gas emissions that are causing climate change. The region is projected to be one of the fastest growing energy markets in the coming decades so the actions this region takes on clean energy and climate change will

be critical in helping the world move to a climate safe trajectory. The United States has an important role to play in helping this region shape its energy future in a responsible and environmentally sound manner. This action will help create new markets for renewable energy and energy efficiency companies and workers, help secure a more stable region, and protect all Americans from the devastating impacts that will occur if we don't act aggressively on climate change.

We have a responsibility to protect our children and future generations from the effects of climate change by reducing emissions of carbon dioxide and other heat-trapping pollutants. The historic Paris Agreement secures commitments to cut carbon pollution from all major countries, including the key countries in the Asia region. The U.S. can help these countries meet their climate targets by helping further unleash the clean energy potential in the region.

A new dynamic has emerged in the Asia region as reflected in the historic Paris

Agreement on climate change. For almost two decades opponents of climate action in the U.S. have argued that the U.S. shouldn't act until other major emitters also act. In the past couple of years one of the key shifts is the perception that countries like China aren't doing anything on climate change – a relic of the debate almost two decades ago – to a new reality – that all major emitters are taking more aggressive climate action. The Paris Agreement adopted last December reflects this shift.

Countries finalized an historic new international climate change agreement that includes new climate commitments from all major countries and sets in motion efforts to require deeper

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¹ The Energy Information Administration (EIA) in its International Energy Outlook 2016 projects that primary energy use in "OECD Asia" will grow at 0.8 percent per year from 2012-2040 and "non-OECD Asia" will grow at 2.2 percent per year over this timeframe. In comparison, EIA projects that Africa's primary energy-use will grow at 2.6 percent per year from 2012-2040.

emissions reduction commitments from all countries over time. The agreement contains provisions to hold countries accountable to their commitments and mobilize greater investments to assist developing countries in building low-carbon, climate-resilient economies.

The countries in the Asia region play an important role in helping ensuring that the Paris Agreement delivers over time. These countries are already showing that they are prepared to help the Paris Agreement deliver. When the Paris Agreement was opened for signature over 175 countries – including all key countries in the Asia region – signed the Agreement, signifying their intent to formally join. And, leading Asian countries are moving forward with their relevant domestic processes to formally join the Agreement.

In order for the Paris Agreement to "Enter into Force", fifty-five countries that account for fifty-five percent of the world's emissions will need to formally join. There is a high likelihood that we will reach these thresholds this year. Fifty-nine countries that account for more than sixty percent of the world's emissions have publicly announced that they will formally join the Paris Agreement this year. Last week, China formally joined the Paris Agreement alongside the U.S. More countries in the region are likely to follow the U.S. and China this year as most of the key countries in the Asia region have announced their intent to formally join the Agreement this year.

Key countries in Asia have put forward robust climate and clean energy targets as a part of the Paris Agreement. Before and during the meeting in Paris, 187 countries responsible

² According to the tally from NRDC based upon public announcements by key government officials.

³ See: https://www.whitehouse.gov/the-press-office/2016/09/03/fact-sheet-us-china-cooperation-climate-change

⁴ According to NRDC calculations, see Table 1.

for more than 97 percent of the world's climate pollution announced specific plans – so called "intended nationally determined contributions" (INDCs) – which outline the emissions reduction targets that they will commit to in the Paris Agreement. Key countries in the region have meaningful climate targets as a result of the Paris agreement including:⁵

- <u>China</u> committed to: peak its carbon pollution no later than 2030 with the intention to try to peak early, increase the non-fossil fuel share of all energy to around 20 percent by 2030; and to reduce carbon emissions per unit of gross domestic product GDP by 60 to 65 percent from 2005 levels by 2030;⁶
- <u>India</u> committed to: reduce emissions intensity by 33 to 35 percent from 2005 levels by 2030, increase cumulative electric power installed capacity from non-fossil fuel energy resources to 40 percent by 2030, and create additional carbon sequestration of 2.5 to 3 billion tons of carbon dioxide equivalent by 2030;
- <u>South Korea</u> committed to reduce greenhouse gas emissions by 37 percent from business-as-usual levels by 2030 across all economic sectors;
- Japan committed to cut its emissions 26 percent below 2013 levels by 2030; and
- <u>Vietnam</u> committed to cut greenhouse gas emissions eight percent by 2030 compared to the business-as-usual scenario.

⁵ For a brief summary on new climate targets of key countries, see: https://www.nrdc.org/experts/jake-schmidt/paris-climate-agreement-explained-what-actions-did-countries-commit-implement. For a summary of the climate targets of key Asian countries see Table 2.

⁶ This is a commitment to even deeper cuts in the country's climate pollution than many expected was achievable just a few short years ago. In fact, prior to the announcement many experts predicted that China's emissions wouldn't peak for several more decades. Prior to the announcement, the U.S. Energy Information Administration's reference scenario, projected that China's CO₂ emissions wouldn't peak until well after 2040, and other estimates followed a similar trend.

<u>Indonesia</u> – committed to cut emissions by 29 percent by 2030 compared to its BAU level.

The Asia region is a major market for clean energy and this opportunity is poised for significant expansion. The Asia region has witnessed a huge uptick in its clean energy deployment the past few years. According to Bloomberg New Energy Finance, clean energy investment in the Asia and Pacific region totaled \$161 billion in 2015 – an increase of almost 700 percent since 2005. This clean energy deployment is being driving by the renewable energy and energy efficiency policies in these key countries, coupled with the continued decline of the cost of clean energy. For example:

• <u>China</u> has a National Renewable Energy Law that has helped the country increase its domestic wind and solar energy deployment from almost nonexistent levels a decade ago to the largest in the world today. More recently, China's renewable energy deployment has been aided by renewable energy quotas that require provinces to meet specific non-hydro renewable energy targets. China's wind power grew by an incredible 32.5 GW and its solar PV by 15 GW in 2015, to a total of 129 GW and 43 GW respectively. Similar opportunities are materializing in China's energy efficiency efforts.

China achieved its energy-intensity target set in its 12th Five Year Plan (2011-2015) and

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⁷ REN21, Renewables 2016: Global Status Report, available at: http://www.ren21.net/status-of-renewables/global-status-report/

⁸ See: Schmidt and Lin, *US and China Formally Join the Paris Agreement*, available at: https://www.nrdc.org/experts/jake-schmidt/us-and-china-formally-join-paris-agreement

has set a binding energy efficiency target in its current Five Year Plan to cut energy consumption per unit of GDP by 15 percent from 2016-2020.⁹

• India's solar market has grown more than 500 fold in the past six years to nearly 8 GW of commissioned projects by the end of July 2016. India is also the world's fourth largest wind energy producer. In energy efficiency, the Indian government is also helping to drive more deployment. The government plans to make the Energy Conservation Building Code mandatory nationally by 2017. This code establishes energy efficiency levels for commercial buildings. Twelve of India's 29 states have adopted the code as of April 2016, and several more plan to follow. India has repeatedly doubled an innovative tax on coal to a current level of over \$6/tonne, with the proceeds earmarked for investments in environmental activities.

The current climate targets, including those contained in the Paris Agreement, mean that Asia's largest economies are committing themselves to clean energy goals and implementing the necessary domestic actions to meet these goals. ¹⁰ For example:

 <u>China's</u> renewable energy deployment is expected to increase to 250 GW for wind power and 150 GW for solar PV by 2020, an average yearly increase of 24.2 GW and 21.4 GW respectively.

⁹ See: Lin, How China's 13th Five Year Plan Climate and Energy Targets Accelerate its Transition to Clean Energy, available at: https://www.nrdc.org/experts/alvin-lin/how-chinas-13th-five-year-plan-climate-and-energy-targets-accelerate-its

¹⁰ See Table 3 for a summary of the renewable energy targets in country INDCs and the current status of renewable energy deployment.

- <u>India's</u> flagship National Solar Mission, which originally aimed to install 20 GW of solar power capacity by 2022, is now targeting 100 GW of solar by 2022. The Modi government is also aiming to achieve 75 GW of wind power capacity by 2022.
- <u>Indonesia</u> has a target to have renewable energy produce 25 percent of its primary energy by 2025.

As a result, deployment of clean energy in the Asia region is projected to continue to surge in the coming years driven by their climate targets in the Paris Agreement and the declining cost of renewable energy technologies. According to Bloomberg New Energy Finance:

"The Asia-Pacific region will experience colossal growth in new power generation capacity over the next 25 years, with installed capacity tripling and electricity generation doubling. Renewable energy will make up nearly two-thirds –or \$3.6tn –of the 4,890 GW added during this period."

The United States can help the Asia region embark on a clean energy future. The best course for the U.S. is to embrace this clean energy transition and strengthen our engagement in the Asia region focused around clean energy deployment. Towards that end, the U.S. should work with key countries in the region by:

(1) <u>Strengthening our bilateral engagement.</u> The U.S. has active climate and clean energy bilateral agreements with a number of countries in the region including China and India.

These bilateral efforts have made important strides in helping these countries unleash stronger climate and clean energy actions. The U.S. should strengthen bilateral efforts

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¹¹ Bloomberg New Energy Finance, New Energy Outlook 2016: Powering a Changing World.

with China and India as they embark on major clean energy deployment efforts. At the same time, the U.S. has bilateral agreements with a number of countries in the region that are less developed (e.g., Indonesia and Vietnam). Following from the Paris Agreement, the U.S. should work with Indonesia and Vietnam to help these countries meet their energy needs in a low carbon manner. Both countries have large untapped renewable energy potential.

- (2) Helping create the policy and finance landscape for even greater action. Energy deployment has moved away from a world where the "economics" favor dirty sources of energy, as wind, solar, and other renewable energy sources are now cost competitive even without factoring in the damaging climate costs of dirty energy. As a result, it is important to ensure that countries create both the right policy and finance dynamics to attract the needed private sector investments. For example, NRDC has found that new innovative finance models such as Green Banks and Green Bonds can help key countries unleash even larger amounts of private finance. The U.S. should play a key role in helping countries in the Asian region put in place better policy and finance frameworks to unleash the huge clean energy potential in the region.
- (3) Mobilizing U.S. investments. The U.S. should expand its investments in clean energy deployment in the region. By mobilizing U.S. investments for the Green Climate Fund (GCF), the U.S. helps to create growing clean energy markets in the Asia region. The U.S. should continue to fund the regular contributions to the GCF in order to meet the pledge of \$3 billion. At the same time, the U.S. can also help to mobilize additional

¹² NRDC, Greening India's Financial Market: Opportunities for a Green Bank in India, available at: https://www.nrdc.org/resources/greening-indias-financial-market-investigating-opportunities-green-bank-india investments through the Overseas Private Investment Corporation, the Millennium Challenge Corporation, trade missions, and other venues where the U.S. helps to catalyze private sector investments.

The U.S. needs to be responsible with other sources of energy. The U.S. and the Asia region also have energy interactions outside of clean energy. The U.S. must pursue these dynamics in an environmentally and climate-sound manner. NRDC acknowledges that nuclear energy will likely continue to play a role in the energy policies of countries in the Asia and Pacific region – notably China now has the greatest number of nuclear reactors under construction, and South Korea is developing as an exporter of nuclear reactors. However nuclear safety and spent nuclear fuel management are continuing challenges for the nuclear industry globally, and are enormous problems for Japan at this time. In addition, the capability to reprocess spent nuclear fuel being pursued by China and South Korea and unsuccessfully attempted in Japan is uneconomical; does not reduce the nuclear waste burden; has no merit in addressing climate change; and increases the risk of nuclear weapons proliferation from separating plutonium. NRDC opposes the reprocessing of spent nuclear fuel, and instead advocates for direct disposal of the highly radioactive waste in a deep geologic repository.

A number of countries in the Asia region are interested in U.S. oil and gas exports.

Exports of oil and gas must be thoroughly and comprehensively analyzed to assess the full cumulative environmental impacts. Yet this analysis is not being done when new projects are considered. The potential impacts include not only the greenhouse gas emissions of the full life cycle, including those from any increased oil and gas production and transmission, but also

toxic air pollutants, contamination of groundwater and surface water, significant safety hazards, harms to the quality of life and economies of local communities, and destruction of sensitive ecosystems and wildlife habitat.

Conclusion. The U.S. can help Asian countries meet their growing energy needs in a low carbon and environmentally responsible manner. By working directly with key countries in the region to unleash their clean energy potential, the U.S. can help American companies and workers tap into this growing clean energy demand and help stave off the damages of climate change. The U.S. should work actively with key Asian countries to help them meet and exceed their climate and clean energy targets and put the world on a much safer climate trajectory.

Thank you.

Table 1: Status of key Asian countries in formally joining the Paris Agreement

Country	Signed the Paris Agreement?	Formally Joined?	Share of Emissions
China	Yes	Formally joined	20.09%
India	Yes	No announcement yet	4.10%
Indonesia	Yes	Announced - before end of 2016	1.49%
Japan	Yes	Announced - before end of 2016	3.79%
Malaysia	Yes	No announcement yet	0.52%
South Korea	Yes	No announcement yet	1.85%
Vietnam	Yes	Announced - before end of 2016	0.72%

Source: Natural Resources Defense Council, based upon public announcements

Table 2: National climate targets of key Asian countries as a part of the Paris Agreement

Country	Intended Nationally Determined Contribution	
China	Reduce carbon intensity 60%-65% relative to 2005, 20% non-fossil fuels by 2030, increased forest cover, and to achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early.	
India	reduce intensity 33-35% by 2030 relative to 2005	
Indonesia	Reduce emissions 29% below BAU by 2030 (unconditional); reduce emissions 41% below BAU by 2030 (conditional)	
Japan	26% below 2013 levels by 2030	
Malaysia	Malaysia intends to reduce its greenhouse gas (GHG) emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. This consists of 35% on an unconditional basis and a further 10% is condition upon receipt of climate finance, technology transfer and capacity building from developed countries.	
South Korea	37% below BAU of 850.6 MtCO2e by 2030 (25.7% domestically and 11.3% by international market mechanisms)	
Vietnam	GHG emissions will be reduced by 8% by 2030 compared to the Business as Usual scenario (BAU). The above-mentioned contribution could be increased up to 25% with international support.	

Source: Natural Resources Defense Council, based upon country INDC submissions

Table 3: Summary of Renewable Energy Policies and Goals of Select Asian Countries

Country	INDC Renewable Goals	Current renewable levels
China	 To accelerate the construction of low-carbon communities in both urban and rural areas, promoting the construction of green buildings and the application of renewable energy in buildings, improving low-carbon supporting facilities for equipping communities and exploring modes of low-carbon community operation and management; To proactively promote the development of hydro power, on the premise of ecological and environmental protection and inhabitant resettlement; To scale up the development of wind power; To accelerate the development of solar power; To proactively develop geothermal energy, bio-energy and maritime energy; To achieve the installed capacity of wind power reaching 200 gigawatts, the installed capacity of solar power reaching around 100 gigawatts and the utilization of thermal energy reaching 50 million tons coal equivalent by 2020; To scale up distributed energy and strengthen the construction of smart grid. 	 By 2014 the following has been achieved: The share of non-fossil fuels in primary energy consumption is 11.2%; The installed capacity of on-grid wind power is 95.81 gigawatts (90 times of that for 2005); The installed capacity of solar power is 28.05 gigawatts (400 times of that for 2005); The installed capacity of nuclear power is 19.88 gigawatts (2.9 times of that for 2005).

Country	INDC Renewable Goals	Current renewable levels
India	 On the demand side, efforts are being made to efficiently use energy through various innovative policy measures under the overall ambit of Energy Conservation Act. Achieve 175 GW renewable energy capacity in the next few years With a potential of more than 100 GW, the aim is to achieve a target of 60 GW of wind power installed capacity by 2022. The ambitious solar expansion programme seeks to enhance the capacity to 100 GW by 2022, which is expected to be scaled up further thereafter A number of programmes have been initiated for promotion of cleaner and more efficient use, including biomass based electricity generation. It is envisaged to increase biomass installed capacity to 10 GW by 2022 from current capacity of 4.4 GW. National Smart Grid Mission has been launched to bring efficiency in power supply network and facilitate reduction in losses and outages. Green Energy Corridor projects worth INR (Indian National Rupee) 380 billion (USD 6 billion) are also being rolled out to ensure evacuation of renewable energy. The National Mission for Enhanced Energy Efficiency (NMEEE) aims to strengthen the market for energy efficiency by creating a conducive regulatory and policy regime. It seeks to upscale the efforts to unlock the market for energy efficiency and help achieve total avoided capacity addition of 19,598 MW and fuel savings of around 23 million tonnes per year at its full implementation stage. The programmes under this mission have resulted in an avoided generation capacity addition of about 10,000 MW between 2005 and 2012 with government targeting to save 10% of current energy consumption by the year 2018-19. 	 Between 2002 and 2015, the share of renewable grid capacity has increased over 6 times, from 2% (3.9 GW) to around 13% (36 GW). Wind energy has been the predominant contributor to the renewable energy growth in India accounting for 23.76 GW (65.2%) of the renewable installed capacity, making India the 5th largest wind power producer in the world. Solar power installed capacity has increased from only 3.7 MW in 2005 to about 4060 MW in 2015, with a CAGR of more than 100% over the decade. Biomass energy constitutes about 18% of total primary energy use in the country and more than 70% of the country's population depends on it. However, it is currently used in an inefficient manner with high levels of indoor pollution. India had 258GW of total power capacity at the end of 2014 of which renewables represented 34GW (13%). It has been estimated that thanks to strong sun, India has the potential to host no less than 749GW of solar power generating capacity. As of the end of 2014, however, the country had just 3GW installed. The 100GW solar by 2022 target outlined by the Modi government suggests 12GW of new build will be needed per year.

 Aims to boost renewables' share of the total primary energy mix to 23% by 2025, compared to 15% previously. The government also plans to encourage distributed renewable energy with an eye toward achieving 100% electrification by 2020 (up from 84.5% today). Indonesia It has conducted reverse auction programs for power contracts with geothermal and solar projects. Meanwhile, biomass & waste and small hydro projects have been offered feed-in tariffs. The country also has biofuel consumption mandates for the transport, commercial and power generation sectors. Furthermore, the government makes available a broad range of tax incentives, including income tax rebates, accelerated depreciation and exemptions on import VAT. Unfortunately, project development has been slower than expected largely because these policies have not delivered.
The reverse auctions have not been conducted successfully, and the feed-in tariff rates were not sufficiently high to generate excitement among private developers. Furthermore, regulatory barriers have significantly slowed the rate of project approval, and financing difficulties have caused a halt in project development. In 2014 only 100MW of renewable capacity was built.
• Expanding renewable energy introduction to the maximum extent possible • Energy efficiency goals in commercial and residential sectors. Total Power Generation: 1065 billion kWh • Renewables 22-24% (Solar, 7%, Wind 1.7%, Geothermal 1.0-1.1%, Hydro 8.9-9.2%, Biomass 3.7-4.6%)
• The Tenth Malaysia Plan (2011-2015) focussed on sustainable growth and introducing mitigation strategies to reduce emissions of GHG. A significant tool included in this plan is the introduction of a feedin-tariff (FiT) mechanism in conjunction with the Renewable Energy Policy and Action Plan (2010) to help finance renewable energy investment, providing fiscal incentives and funding for green technology investments and promoting projects eligible for carbon
credits.

Country	INDC Renewable Goals	Current renewable levels
Vietnam	 Innovate technologies and apply advanced management and operation procedures for efficient and effective use of energy in production, transmission and consumption, especially in large production facilities where energy consumption is high; Apply energy savings and efficiency, and renewable energy applications in the residential sector, trade and services; Develop public passenger transport, especially fast modes of transit in large urban centers. Restructure freight towards a reduction in the share of road transport in exchange for an increase in the share of transportation via rail and inland waterways; Establish standards on fuel consumption, and develop a roadmap to remove obsolete operations Change the energy structure towards a reduced share of fossil fuel, encouraging the exploitation and use of renewable and low GHG emission energy sources; Apply market instruments to promote structural change and improve energy efficiency; encourage the use of clean fuels; support the development of renewable energy; implement the roadmap to phase out subsidies for fossil fuels; Develop and implement financial and technical mechanisms and policies to support research and the application of appropriate advanced technologies; exploit and optimize the use of renewable energy sources, both on-grid as well as off grid; Develop a renewable energy technology market, domestic industries and local service providers. 	 The Government has issued many policies on energy saving and efficiency, such as the "National Target Programme on Energy Efficiency" (2006), the Law on "Economical and Efficient use of Energy" (2010). The Government has prioritized policies, such as renewable energy development, consistent with Viet Nam's mitigation potential and conditions, in order to contribute to energy security and environmental protection. Policies encouraging energy savings and efficiencies in production and daily life, through the application of energy saving and renewable energy technologies, are also a priority. Vietnam currently relies mostly on large hydropower and natural gas to meet its electricity needs, with the former accounting for 40% (59.8TWh) and the latter 30% (44.9TWh) of its total power generation of 148TWh. Both sources will recede from the total power mix in coming decades if the country's 'Power Master Plan 7' is carried out. The government targets an increase in electricity generated from non-hydro renewable sources from the present 3.5% to 4.5% in 2020 and 6% in 2030. Wind and biomass are the sectors identified to realize the target. The installation target for wind is 1GW by 2020 and 6.2GW by 2030; for biomass it is 0.5GW by 2020 and 2GW by 2030. Feed-in tariffs have been introduced for wind energy and biomass energy. A preferential taxation policy offers an income tax rate of 10% for 15 years to all renewable energy technologies, compared to the statutory rate of 25%. Alternatively, project developers can enjoy tax exemption for the first four years and a 50% reduction in tax payable for nine subsequent years.
Source: Nature	al Resources Defense Council, compiled from country "INDC" submissions o	and ClimatoScope

Source: Natural Resources Defense Council, compiled from country "INDC" submissions and ClimateScope.