OPPORTUNITIES FOR ACCELERATING THE ENERGY TRANSITIONS THROUGH ENHANCED DEPLOYMENT OF RENEWABLES

ANNEX I
VOLUNTARY NATIONAL SELF-ASSESSMENTS

June 2018

Note: This document is only being shared among the G20 membership but will not be divulged publicly

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I-1 Survey of G20 Renewable Energy: Template used for Voluntary National Self-Assessments

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I-2 Overview of G20 Renewable Energy Submissions received

Argentina´s G20 Presidency 2018 asked the International Renewable Energy Agency (IRENA) to analyse progress in the deployment of renewable energy in G20 countries. At the first meeting of the G20 Energy Transitions Working Group (ETWG), held in Buenos Aires on 22-23 February 2018, G20 members discussed and shared their experiences and good practices with renewables. Eighteen countries shared their experiences through Voluntary National Self-Assessments, out of which the following G20 members, Argentina, Australia, Brazil, China, European Union, Germany, India, Indonesia, Italy, Japan, Mexico, Republic of Korea, South Africa, Turkey and United Kingdom as well as G20 invited countries Chile, Netherlands and Singapore. These are reproduced in Annex I, and are only being shared among the G20 membership, but will not be divulged publicly.

The G20 Presidency circulated a template to the countries asking them to select an example of one good practice in their respective country in relation to any of the following topics: (i) access to finance and risk mitigation instruments, (ii) integration of renewable energy in power systems, or (iii) innovation for the emergence and deployment of renewable energy technologies.

Table 1 below presents an overview of the selected examples of good practices presented for each country.

Most of the templates presented covered a policy instrument to support renewable energy deployment such as the RenovAr programme in Argentina, the net metering for distributed generation and national biofuels policy in Brazil, auctions in Turkey, auctions and clean energy certificates in Mexico, REIPPP in South Africa and Contract for Difference in the UK. Good practices and lessons learnt in the design and implementation of those policy instruments were discussed in Chapter 2 of the main report in the section on policies for the power sector, and many of the cases presented in the templates are highlighted as examples.

Some templates presented strategies and plans, acts, or laws such as the Fukushima Plan for a New Energy Society or the Basic Hydrogen Strategy in Japan, the Australian Renewable Energy Agency Act of 2011, the Renewable Energy Sources Act (EEG) in Germany, National Energy General Plan (RUEN) in Indonesia and the Renewable Energy Directive of the EU. Where applicable, also such plans and strategies and programmes were referenced in the report.

Finally, other templates covered projects such as the Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas in China or the Intra-state transmission system green energy corridor in India.

Table 1 Summary templates received

Country	Policies presented
Argentina	RenovAr
Australia	The Australian Renewable Energy Agency Act 2011 (ARENA)
Brazil	- Net metering for distributed generation - National biofuels policy - Isonomic conditions for renewables in isolated power systems
Chile	Not G20 but sent on solar rooftop for public building programme
China	Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas
European Union	Renewable Energy Directive
Germany	Renewable Energy Sources Act (EEG)
India	Intra-state transmission system green energy corridor
Indonesia	National Energy General Plan (RUEN)
Italy	Reference to the PAMS
Japan	- The Fukushima Plan for a New Energy Society - Basic Hydrogen Strategy
Mexico	Electricity Reform, Auctions, clean energy certificates
Netherlands	Not G20 but submitted template on the Offshore wind energy plan
Republic of Korea	Renewable energy 2030 implementation plan
Singapore	Not G20 but sent on reviewing and streamlining existing regulations to facilitate the entry of small distributed solar installations
South Africa	South Africa's Renewable Energy Plan and its RE Independent Power Producer Programme (REIPPP)
Turkey	RE-ZONE auctions for solar and wind
United Kingdom	Contract for Difference (CfD)

The templates submitted are found in Section I-3. They are presented as received with minor changes to adjust the layout.

I-3 Voluntary National Self-Assessments submitted

Argentina

Argentina	
RenovAr Programme	
Date of implementation	Launched on May 2016 and still ongoing
Enforcement authority	Undersecretariat of Renewable Energy / Ministry of Energy and Mining
Goals and estimated results (e.g. in terms of share of RE)	Act 27,191, passed in 2015, has set up ambitious targets to achieve an increasing share of renewable energy in the short, mid- and long terms, until reaching 20% of the total national consumption of electricity by 2025. The RenovAr Programme was launched as a first step to comply with this mandatory target. RenovAr is conceived as a national and international public tendering programme for the purchase of electricity from renewable energy sources, which contemplates for tax credit incentives and financing mechanisms, along with regulatory and contractual enhancements aimed at overcoming some of the investment barriers. A key feature of the programme relies on this particular mechanism, which has been structured as a risk mitigation instrument, with a view to provide the awarded projects with a set of guarantees.
Brief summary of policy/programme design	The contractual framework is based on two main agreements that provide all customary elements in a typical renewable energy PPA. Along with a PPA, project companies enter into a FODER Trust Adhesion Agreement (Fund for the Development of Renewable Energy), and become "beneficiaries" of the FODER Trust Fund, a public trust structured with two trust accounts (financing and guarantee). Its main objective is to provide energy payment (liquidity) and termination payment (solvency) guarantees. In case CAMMESA (the Argentine national grid operator in charge of the energy dispatch and management of the economic transactions in the wholesale market) is unable to pay in full for the electricity on due date, the FODER backstops CAMMESA by using funds that are kept in its Energy Payment Guarantee account. The "second level" of guarantees (solvency guarantee) have been designed and implemented by means of a put option mechanism. The project company may exercise its put option and transfer the project assets (not the project company) to the FODER and receive a cash compensation. The put

Argentina	
RenovAr Programme	
	option may also be triggered by other causes, aiming to mitigate the main factors of country risk. The sovereign guarantees have also been implemented through Treasury Bills. An optional "third level" of guarantee was offered to all bidders. The Government of Argentina (GoA) has reached an agreement with the World Bank (acting through the International Bank for Reconstruction and Development, IBRD) under which the IBRD backstops FODER for up to USD 730 million in its obligation to pay for the project assets in case project companies exercise the put option and the GoA does not provide the funds to pay, either fully or in part. All fees payable to the IBRD under this guarantee shall be paid by the project companies as requested.
Beneficiaries	The beneficiaries are national or foreign legal entities, for the purpose of executing power purchase agreements to be signed with CAMMESA, with the objective of increasing electricity generation capacity from renewable sources.
Multidimensional impacts (e.g. social, labour and technological development impacts)	*(April 2018)* 147 projects awarded, which will represent almost 4,500 MW of new capacity and 15 TWh/year, generating enough electricity for 4,5 million households. Moreover, 8,4 tons of CO_2 emissions could be reduced.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	*(April 2018)* USD 7 billion of direct investment expected (by April 2018, USD 2,5 billion in progress). Promotional benefits and fiscal incentives for electric power generators and local manufacturers: advance Value Added Tax return and accelerated depreciation to be applied when calculating the Income Tax, among others.
Environmental safeguards	The recent request for proposals from August, 2017 (Res. 275), includes the Environmental and Social Management Plan (PMAS), with the aim of generating a proper monitoring of the projects and their interaction with the environment. This plan reflects the assessment of the environmental impacts and defines risk management strategies for the projects. Moreover, it identifies the mechanisms and processes for the implementation and monitoring of the environmental and social criteria adopted for the renewable projects, so as to promote appropriate environmental and social care. Awarded projects that take the World Bank Guarantee are exempted from the PMAS requirements; instead, they must observe the Performance Standards on Environmental and

Argentina	
RenovAr Programme	
	Social Sustainability, (eight standards set by the International Finance Corporation (IFC), which offer a guide to identify risks and impacts in order to prevent, mitigate and manage them, so as to perform private enterprises and businesses involved in a sustainable way). All projects must comply with existing national, provincial and municipal regulations.

Australia

Australia	
Australian Renewable Energy Agency (ARENA)	
Date of implementation	1 July, 2012
Enforcement authority	The Australian Government via the *Australian Renewable Energy Agency Act 2011*
Goals and estimated results	Goals • Improve the competitiveness of renewable energy technologies; • Increase the supply of renewable energy in Australia. Estimated Results • 2030 impact: increase in supply of renewable energy through: - a secure, reliable and affordable electricity system operated with a significantly higher share of renewable energy - improved energy productivity enabling achievement or exceeding or targets in the National Energy Productivity Plan - commercial scale export value chains in renewable energy established
Brief summary of policy/programme design	• ARENA supports the research, development, deployment and commercialisation of local renewable energy technology through a three-pronged approach: 1. Provides **funding** to researchers, developers, and businesses that have demonstrated the feasibility and potential commercialisation of their project; 2. Builds and supports **networks**; 3. Shares the **knowledge**, insights, and data from funded projects. • ARENA also advises the government on renewable energy technologies, including: - Improving the competitiveness of renewable energy technologies; - Increasing the supply of renewable energy in Australia; - Improving the development of skills in the renewable energy technology sector; - Increasing the use of renewable energy technologies.
Beneficiaries	**Primary:** Researchers, developers, businesses **Secondary:** Australian electricity consumers
Multidimensional impacts (e.g. social, labour, and technological development impacts)	Social • Improving energy accessibility in remote communities: - Off-grid and fringe-of-grid portfolio projects allow access to solar energy in remote areas. • Lowering energy costs for consumers:

	- National large-scale solar is now deployed without the need for ARENA support in line with wind power (5 years earlier than expected).
	Labour/Economic
	• Generating employment: - ARENA's large-scale solar round created around 1400 new jobs across the country during construction, reviving rural towns and creating new industry supply chains in regional Australia. • Creating investment opportunities: - ARENA has provided over $1 billion in funding - The overall leverage ratio across all ARENA contracted projects is 1:2.39 - $3.5 billion more worth of projects are currently in the pipeline.
	Technological Developments
	• ARENA projects have helped to break 11 solar cell efficiency world records thus far. - Including a record for sunlight-to-electricity conversion using unfocused sunlight. • World leading demonstrations in a range of areas including: - Largest solar PV and battery storage integrated at an isolated mine in the world - 14,000 cumulative operating hours of a wave array, a world record in the global wave energy industry - Large-scale virtual power plant trial connecting solar and battery storage systems across 1,000 residential and business premises.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	ARENA's core grant funding is covered in the ARENA Act 2011, which provides the agency with $2 billion to invest in renewable energy projects until 2022.
Environmental safeguards	In consultation with industry, ARENA has developed a methodology to assess the life cycle impacts of bioenergy (including biofuel) projects. The assessment method considers whether or not the new technologies and industries that ARENA is seeking to enable will deliver a 'net benefit' in environmental terms. ARENA considers environmental impacts as part of the due diligence process when assessing applications and takes a proactive approach to managing risk (including environmental impacts) for funded projects.

Brazil

Brazil	
Net metering mechanism for distributed generation	
Date of implementation	April, 2012 – Updated in November, 2015.
Enforcement authority	ANEEL – Brazilian Electricity Regulatory Agency.
Goals and estimated results (e.g. in terms of share of RE)	Small scale distributed PV and biogas plants are anticipated to contribute with almost 4 GW capacity by 2026, according to the Ten-Year Energy Expansion Plan.
Brief summary of policy/programme design	Brazilian net-metering scheme was introduced in 2012, through the Normative Resolution no. 482, from ANEEL. In 2015, the resolution was amended through the Normative Resolution no. 687. The resolution established the rules for the access of small-scale (up to 5 MW) generation systems to the distribution grid. It also defined that the electricity produced can be used for self-consumption or injected into the distribution grid, resulting in energy credits that can be compensated afterwards, over a period of 60 months. The mechanism allows different business models such as self-consumption; remote self-consumption; condominiums; consortiums/cooperatives (virtual net-metering). In 2013, at the beginning of the net metering implementation, the National Council of Fiscal Policy (CONFAZ) established that the state tax levied on product circulation (ICMS) must be applied over the gross electricity consumption. Later in 2015, CONFAZ implemented the taxation over the net consumption, which enhanced the overall competitiveness of new projects on the net metering scheme.
Beneficiaries	The policy is designed to bring an overall benefit to the environment, by reducing GHG emissions, positively affecting the population.
Multidimensional impacts (e.g. social, labour and technological development impacts)	Foster a widespread labor market and the participation of smaller companies and investors.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	The net-metering scheme, in combination with volumetric rates, creates a cross subsidy between customers, but due to the incipient level of the diffusion of distributed generation in Brazil, the impact is still marginal on electricity rates. A binomial tariff system is being discussed

Brazil	
Net metering mechanism for distributed generation	
	within the regulatory framework for distributed generation of ANEEL.
Environmental safeguards	-

Brazil	
Isonomic conditions for renewables in Isolated Power Systems	
Date of implementation	May 10th, 2017
Enforcement authority	Ministry of Mines and Energy, ANEEL and EPE
Goals and estimated results (e.g. in terms of share of RE)	Provide isonomic conditions for renewables to compete with diesel solutions in electricity auctions to supply isolated systems.
Brief summary of policy/programme design	Before May 2017, developers of diesel-based supply solutions for Isolated Systems had a very simplified prequalification process, while those subscribing projects with renewables (combined or not with diesel) had much more stringent prequalification requirements. After May 2017, with the publishing of decree 9047, every single project must prequalified in equal conditions, eliminating a competitive advantage diesel generators had in relation to renewable-based solutions. Moreover, the resulting reduction in the consumption of diesel due to new renewable generation can be accounted for abatement of up to 100% of CAPEX of such projects.
Beneficiaries	- Local inhabitants: renewables can contribute to reducing pollution and noise from thermal generation; - Electricity consumers: reduced costs of generation in isolated systems are funded by all electricity consumers of the country (a fee in the bill).
Multidimensional impacts (e.g. social, labour and technological development impacts)	Carbon emissions and noise reduction when changing conventional generation (based on fossil fuels) to renewables. The supply chain of diesel in the Amazon region, where most Brazilian isolated systems are located, relies on complex logistics, mostly done by boat, powered by diesel engines. Therefore, reducing thermal power generation also leads to a reduction of emissions in the transport sector.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget,	Renewables can contribute to a lower energy tariff, but also affect taxes collection.

Brazil	
Isonomic conditions for renewables in Isolated Power Systems	
estimated cost of policy/programme)	There are taxes in diesel price. When reducing fuel consumption, less taxes will be collected by states, impacting public budget. After the city of Macapá was connected to the national grid, there was a 14% reduction in the state´s consumption tax collection, due to the shutting down of local thermal power plants. Each state should feel the impact differently, depending on specific conditions.
Environmental safeguards	None

Brazil	
National Biofuels Policy	
Date of implementation	2018
Enforcement authority	The National Council for Energy Policy (CNPE) and the National Agency of Petroleum, Natural Gas and Biofuels (ANP).
Goals and estimated results (e.g. in terms of share of RE)	• Promote the reduction of greenhouse gases (GHG) emissions by the fuel mix, in accordance with the ambitious commitments established under Paris Agreement in December 2015 - 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change; • Contribute to the security of domestic fuel supply by encouraging biofuels production and use
Brief summary of policy/programme design	The goal of the Programme is to create a market-based mechanism that encourages the improvement of energy efficiency along with the reduction of the carbon footprint. First, the CNPE will recommend annual decarbonization targets (gCO2eq per Mega Joule), to be set by the Executive branch for a period of at least 10 years. Then, the ANP in Portuguese will split this national mandatory target into individual targets to be applied to all fuel distributors in proportion to their respective share in the fossil fuel market in the previous year. Each fuel distributor will need a certain volume of "CBIO" (the Brazilian decarboniProgr credit) to achieve their individual targets.

Brazil	
National Biofuels Policy	
	Administrative and monetary sanctions will be applied to non-compliants, including fines that range from R$ 100.000 to up to R$ 50 million (around USD 15 million).
Beneficiaries	The policy is designed to bring an overall benefit to the environment, by reducing GHG emissions, positively affecting the population.
Multidimensional impacts (e.g. social, labour and technological development impacts)	All producers, regardless of the size of their production, may benefit from the CBIO market. The policy will encourage continued technological improvements that increase the decarbonization levels of biofuels. There is also a potential contribution for employment and income generation and for regional development, as well as for the promotion of values related to the sustainable bioeconomy.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	It is estimated that there will be an increase in the Gross Domestic Product, as well as a decrease of refined gas imports
Environmental safeguards	-

Chile

CHILE	
Solar Roofs for Public Buildings Programme - Programa Techos Solares Públicos	
Date of implementation	From 2014 to 2018 (4-year Programme).
Enforcement authority	Ministry of Energy - Renewable Energy Division.
Goals and estimated results (e.g. in terms of share of RE)	Install solar PV systems on public building roofs to contribute to the maturation of the domestic solar PV market for self-supply. Nearly USD 9 million was spent for 133 beneficiary buildings throughout the country from regions of Arica y Parinacota to Biobio. Currently, 120 installations have been completed (90% of the total), with a total installed capacity of 5.2 MW, which represents roughly 26% of domestic solar PV (installed capacity) distributed generation in Chile. The Programme has been designed, funded and implemented by the Ministry of Energy and contributes to fostering the self-supply oriented solar PV market. It is intended to lead in a constant demand of PV solutions for public buildings, to generate public information on costs and conditions of PV projects in Chile, to evaluate regulation and procedures for photovoltaic systems connected to the distribution network, and to help to reduce electricity costs in public buildings.
Brief summary of policy/programme design	In terms of implementation, the programme - firstly - identifies and selects the beneficiary public buildings for solar PV systems, and - secondly - mandates the installations through a public tender. From the Ministry of Energy's side (MoE), the main activities implemented include: ▪ Identification of public buildings, according to defined eligibility criteria; ▪ Project selection that evaluates the building specifications and determines which ones are entitled to receive the specialists' technical visits; ▪ Solutions design elaborated by MoE as a tailored pre-project; ▪ Public tender of the project operated by MoE; ▪ Installation process supervision; ▪ Programme evaluation on a yearly basis, to check the fulfillment of the global target. On the beneficiaries' side, the Public Institutions subscribe an agreement with the Ministry of Energy and commit to:

CHILE	
Solar Roofs for Public Buildings Programme - Programa Techos Solares Públicos	
	▪ Provide all the information required to the MoE; ▪ Manage the administrative procedures related to the Law 20.571, that regulates the net billing tariffs for residential generators; ▪ Watch for the proper operation of the solar PV systems and being responsible for maintenance and eventual repairs; ▪ Report on a yearly basis to the MoE on the implemented maintenance programme.
Beneficiaries	Public buildings and other buildings of organizations that play a key social role for the whole population, such as public institutions, kindergartens, primary and high schools, hospitals, cultural centers and foundations.
Multidimensional impacts (e.g. social, labour and technological development impacts)	Several multidimensional impacts, such as: ▪ Improved visibility of solar PV technology for distributed generation; ▪ Generation of open and public information about solar PV project costs and available technologies; ▪ Realistic assessment of rules and procedures for solar PV installation and inspections; ▪ Capacity building, through the publications of several guides on good practices ("Solar PV roof installations good and bad practices Guide"; "Pre-audit TE-4 check-list Guide"; "Buildings first assessment for solar PV systems installation Guide"; "Solar PV systems operation and maintenance Guide").
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	Several economic and financial impacts, such as: ▪ Create a permanent offer of suppliers of PV systems; ▪ Foster and boost the domestic solar PV market through demand aggregation; ▪ Achieve competitive prices for PV systems similar to those obtained in mature markets. In fact, the observed solar PV technology cost reduction was from approximately 4 USD/Wp for the first tender in 2015 to approximately 1 USD/Wp in 2018; ▪ Contribute to energy related costs reduction in public buildings.
Environmental safeguards	According to the definition of environmental safeguards given by the World Bank and Inter-American Development Bank, whose objective is to prevent and mitigate undue harm to people and their environment in the development process, the

CHILE	
Solar Roofs for Public Buildings Programme - Programa Techos Solares Públicos	
	inherent nature of this Programme does not foresee the implementation of such measures. The environmental impacts are minimized because there is no land use for the solar PV systems installation, that - in addition - have relatively small size and a very low, or zero, visual impact.

China

China	
Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas	
Date of Project Delivery	August 2015
Delivering Parties	Municipal People's Government and Enterprises in Datong
Goals and Expected Outcomes (For instance, the share of renewable energy)	**General goal:** Promoting technological progress, industrial upgrading, market application and reduction of costs in the photovoltaic sector; Enhancing the overall development of the sector through local demonstration so as to speed up the market application of technological outcomes, with market support and demonstration projects. **Major technical goals:** The system efficiency of photovoltaic power plants shall not be lower than 81% in the first year; the conversion efficiency of poly- crystalline silicon photovoltaic modules shall not be less than 16.5%; the conversion efficiency of mono-crystalline silicon photovoltaic modules shall not be less than 17%.
Summary of the Policy/Programme Design	The Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas is China's first photovoltaic base approved by the state to be included in the Top Runner plan of the photovoltaic industry. The total construction volume of the base amounted to 1 GW, including 7 standalone projects of 100 MW and 6 standalone projects of 50 MW. The base was approved by the National Energy Administration (NEA) in June 2015. Thanks to optimized project services and technical support, the building of the base commenced in latter part of September that year, and it was integrated into the grid by the end of June 2016.
Beneficiary Parties	China's photovoltaic industry and the renewable energy sector
Multidimensional Impacts (on the society, labor, and technological developments, etc.)	Through the extensive use of advanced photovoltaic products in the base, the government intends to guide photovoltaic manufacturers to put technological advancement high on their agenda. Consequently, technologies such as PERC have been rapidly adopted by PV manufacturers, leading to a significant scale. The conversion efficiency stated in the 2015 Top Runner Plan has become the norm for the current PV panel modules.
Economic and Financial Impacts (For instance, estimated costs for tax/financial incentives, public budgets, policies/projects for the base developers)	The Datong Municipal People's government has released the Measures for Managing the Project of the Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas to provide policy support for the land use of the base.

China	
Datong National Photovoltaic Demonstration Base for Advanced Technologies Located in Coal Mining Subsidence Areas	
Measures for Protecting the Environment	The building of the base has helped achieve the goal of comprehensive management of subsidence areas. In the construction of photovoltaic power plants and complementary development of forestry and the photovoltaic industry, the first phase of landfill, reinforcement and greening in the subsidence areas so as to prevent exacerbation of water loss and soil erosion has been finished.

European Union

European Union	
Renewable Energy Directive	
Date of implementation	The Directive 2009/28/EC on the promotion of the use of energy from renewable sources was enacted in national law and implemented by EU Member States from 2010. A revision of the Directive is currently being discussed to repeal and replace the existing framework as of 2021.
Enforcement authority	European Commission, European Court of Justice
Goals and estimated results (e.g. in terms of share of RE)	The Directive on renewable energy sets ambitious binding targets for all Member States, such that the EU will reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy specifically in the transport sector. It also improves the legal framework for promoting renewable electricity, requires national action plans that establish pathways for the development of renewable energy sources including bioenergy, creates cooperation mechanisms to help achieve the targets cost effectively and establishes the sustainability criteria for biofuels. Up from 10.4% in 2007, renewables now represent more than 17% of the EU's final energy consumption and the EU is on track to meet its collective 20% target by 2020. The share of renewable electricity has already increased up to 29%, and 85% of newly installed capacity in the EU27 in 2017 consisted of renewable energy capacity. The proposal for a revised Directive sets a 27% target for 2030, as well as sector-specific targets for transport and heating and cooling.
Brief summary of policy/programme design	The Renewable Energy Directive establishes an overall policy framework for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020. The Directive specifies national renewable energy targets for each country, taking into account its starting point and overall potential for renewables. These targets range from a low of 10% in Malta to a high of 49% in Sweden. EU countries set out how they plan to meet these targets and the general course of their renewable

European Union	
Renewable Energy Directive	
	energy policy in national renewable energy action plans. Progress towards national targets is measured every two years when EU countries publish national renewable energy progress reports. The Directive promotes cooperation amongst EU countries (and with countries outside the EU) to help them meet their renewable energy targets through statistical transfers and joint renewable energy projects or support schemes. The Renewable Energy Directive also sets out biofuels sustainability criteria for all biofuels produced or consumed in the EU to ensure that they are produced in a sustainable and environmentally friendly manner. Companies can show they comply with the sustainability criteria through national systems or so-called voluntary schemes recognised by the European Commission. The current legislative framework runs until 2020. It will be replaced by a new set of instruments and targets until 2030. The "Clean Energy for All Europeans" legislative package, which should be enacted by the end of this year, includes provisions to support the energy transition towards higher shares of renewables, especially in the buildings, transport and industry sectors. To this extent, it identifies several key areas for action: • Strengthening the regulatory certainty for investments to further encourage deployment of renewables in particular in the electricity sector; • Mainstreaming renewables in the heating and cooling sector; • Decarbonising and diversifying the transport sector; • Empowering and informing consumers; • Strengthening the EU sustainability criteria for bioenergy; • Making sure that the EU level binding target is achieved on time and in a cost-effective way.
Beneficiaries	The Directive provides a common and stable framework for the development of renewables, thus offering transparency and security for investors and other economic operators.

European Union	
Renewable Energy Directive	
Multidimensional impacts (e.g. social, labour and technological development impacts)	The renewable energy sector plays a key role for the EU economy with a turnover of around €144bn in 2014 and more than one million people employed. In 2015, renewables contributed to reducing EU greenhouse gas emissions by 436 MtCO2eq, the equivalent of the emissions of Italy. Renewables play a major role in making the EU a global leader in innovation. With EU countries holding 30% of patents in renewables globally, the EU has been a pioneer in this field and is committed to prioritising research and innovation to further drive the energy transition. The distributed nature of renewables, the increasingly competitive costs of renewable technologies, and new developments in smart grids, smart homes, and battery storage solutions also make it possible for energy consumers – both at a domestic and an industrial level - to become active players on the market: • In 2015 in Germany, a typical four-person family household could save almost €680 each year on its annual electricity costs by installing a 4 kWp PV system; In Italy, an average household could save about €720 per year on its electricity bill, with a pay-back period of about 7-9 years, depending on the region; • Those savings will keep increasing with the falling costs of renewable technologies.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	The renewable energy sector already delivers an important dividend to EU energy security with around €20 billion saved in fuel import costs in 2014 for the whole EU. This figure represents the total contribution of renewables to fossil fuel import savings in a given year compared with the situation in 2005. (Source: Öko Institut 2017)
Environmental safeguards	

Germany

Country: Germany
Renewable Energy Sources Act (Erneuerbare Energien Gesetz)
The deployment of renewable energy technologies is a key pillar of the Energiewende in Germany. In this context, the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG) has provided the crucial legislative framework for the support of renewable-generated electricity. It was first adopted in the year 2000 and has regularly been revised since (EEG 2004, EEG 2009, EEG 2012, photovoltaic-amendment, EEG 2014, EEG 2017). The EEG remains the key control mechanism for the deployment of renewable energy technologies. The objective of the EEG is to transform energy supply and to raise the share of renewables in electricity to min. 80% until 2050. The deployment of renewables follows primarily the rationale of climate and environmental protection and the development of a sustainable and cost-efficient energy supply, as well as of renewable-energy technology development. Support through the EEG has contributed significantly to renewable-energy technology development and to the significant technology cost reductions for renewables in recent years, most importantly for solar PV and wind energy, that render these technologies the most cost-efficient options for newly-installed electricity generation capacity in more and more markets around the globe.
Further information Please refer to: Information on the RES Act (EEG) and other aspects of the regulatory framework for renewable energy policy in Germany on the information portal "erneuerbare-energien.de" of the Federal Ministry for Economic Affairs and Energy: https://www.erneuerbare-energien.de/EE/Redaktion/DE/Dossier/eeg.html Information on the RES Act (EEG) and other aspects of the regulatory framework for renewable energy policy in Germany on the website of the Federal Ministry for Economic Affairs and Energy: https://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html

India

Topic: (ii) Integration of renewable energy in power systems : Intra-State Transmission System Green Energy Corridor	
Date of Implementation	The central grant was approved by the Cabinet Committee of Economic Affairs (CCEA) in FY 2015-16. The commissioning schedule is March 2020
Enforcement Authority	It is being implemented by the of eight State Transmission Utilities (Tamil Nadu, Rajasthan, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh and Madhya Pradesh)
Goals and Estimated results	The project includes a total of approx. 8550 ckm transmission lines and Substations of aggregate capacity of approx. 19000 MVA, to evacuate over 20,000 MW of renewable energy.
Brief summary of policy/programme design	In order to facilitate integration of large scale renewable generation capacity, a new scheme of "Green Energy Corridors" has been launched. It is being implemented by eight State Transmission Utilities. The total project cost is Rs. 10141 crores, of which the Government of India is contributing 40% of the total cost, i.e. Rs. 4056 Crores by March 2020.
Multidimensional impacts	The project will result in evacuation of large scale integration of renewable power, strengthen the national grid and improve the power sector.
Economic and financial impacts	The total project cost is Rs. 10141 crores, with funding mechanism consisting of 20% State Equity, 40% Government of India Grant (total 4056.67 crores) and 40% KfW loan (500 million EUR).
Environmental safeguards	The scheme envisages evacuation of over 20,000 MW of renewable power. The renewable energy power plants will in-turn facilitates in reduction of over 30 Million Tonnes of carbon emissions and help in reducing the impact of global warming.

Indonesia

Indonesia	
Presidential Regulation No.22/2017 on General National Energy Planning	
Date of implementation	2 March 2017
Enforcement authority	Ministry and Mineral Resources
Goals and estimated results (e.g. in terms of share of RE)	Indonesia has a target for renewable energy to represent 23% of TPES by 2025.
Brief summary of policy/programme design	The National Energy General Plan (RUEN) is a central government policy on a national energy management plan which is a cross-sectoral translation and implementation plan of the National Energy Policy to achieve the National Energy Policy targets. The RUEN is drafted by the Central Government and established by the National Energy Council. The RUEN is a tool and roadmap for energy management until 2050. Content of RUEN includes these main considerations: 1. Energy is not only considered as export commodity but also as the main driver for economic development. 2. Establishing future energy will be based from mainstreaming renewable energy. 3. The development of energy infrastructures shall be encouraged. 4. Promoting energy conservation and its current development will enhance the technological advancement of the national energy development.
Beneficiaries	
Multidimensional impacts (e.g. social, labour and technological development impacts)	***Multidimensional impacts*** consist of social, manpower and technological development impacts. a. One direct impact is creating 60,000 direct new jobs in PV as estimated by PV Impact Study (GIZ/E.Quadrat 2018). o It has also created skilled-jobs in the PV manufacturing industry from its products, electrical and mechanical components. o It has also improved installations operation and maintenance. b. Another direct impact is creating 38,000 direct new jobs in bioenergy estimated, mainly in palm-oil sector, as cited from Bioenergy Impact Study (GIZ/IET, CER 2017). o It has provided skilled-jobs in the manufacturing industry e.g. fermentation tanks or covers, conventional parts and systems for power plants. o It has also improved operation and maintenance of installations. o It has also leveraged Indonesia's potential in ASEAN leadership on a number of bioenergy-related technology and initiative.
Economic and financial impacts (e.g. tax/financial incentives for developers,	***Economic and financial impacts*** mainly consist of tax/financial incentives for developers; public budget improvement (macro-economic savings); state/public

Indonesia	
Presidential Regulation No.22/2017 on General National Energy Planning	
public budget, estimated cost of policy/programme)	funding generated from non-tax revenue; estimated cost of policy/measure; and economic enhancement for local community. a. In macro-economic savings, one impact is that renewables deployment apart from conventional power generation refers to opportunity costs and losses of coal and diesel fuel. b. In coal energy, one of main opportunity losses is that the cost of unfavorable highest value is possible. For example, coal can be exported at a higher price, while PT PLN can get coal at USD 70 per ton. In diesel fuel use, one of main opportunity losses is that the cost of diesel for electricity generation is lower or subsidized compared to PT Pertamina (Indonesia's National Oil Company)'s market price.
Environmental safeguards	1. Increasing share in renewables can help Indonesia to strengthen energy security, increase energy affordability and energy access while significantly reducing emissions. 2. Increasing renewables uptake will reduce the total costs of the energy system. 3. Scaling up renewables can assist Indonesia increasing public funding source between USD 15.6 billion and USD 51.7 billion per year (Source: REmap Indonesia 2030; 2017). 4. Scaling up the market for renewable energy technologies may provide significant opportunities for increasing national and sub-national industrial capacity, such as creating local manufacturer and distributor for solar panels and electric vehicles industry. This also supports the associated-technology transfer which multiply the positive impacts on employment, environmental aspect and economic growth.

Italy

Country:	ITALY

Energy mix

In 2016, Italian TPES amounted to 167.6 million tonnes of oil-equivalent (Mtoe), down by 13.5% compared with 2007. In the 2007-2016 period the most relevant change in the energy landscape has been the increasing relevance of renewable energy (mainly deployed in the power and heating sector): in 2016 renewable represented 19.1% of TPES compared with 7.4% in 2007 (almost 12 percentage points in just a decade).

Since 2007, Italy's domestic GHG emissions have declined. Several factors such as greater use of renewable energy in the power sector and improvements in energy efficiency have contributed to this decline. Overall, GHG emissions declined by almost 23% from 2007 to 2015 (last official statistics available), with a slight increase (+2.3%) in 2015 after the constant decline registered since 2004. In the considered period GHG emissions' reduction came mostly from the Industrial sector (-28%), followed by Energy (-24%) and Waste (-20%) while Agriculture emissions decreased less (-9%).

The electricity mix has evolved since 2007. In that year, natural gas, coal and oil represented 80% of total generation, including 48% gas, 20% coal and 12% oil. Renewables (mostly hydro) accounted for the remainder. Over the last ten years, solar, wind, and biofuels and waste have boomed, growing steeply. Solar PV energy has experienced the highest level of growth since 2010 as a result of favourable government incentives. In 2016, the share of renewables in domestic generation reached almost 40% and half of their contribution came from solar PV, wind and bioenergies.

Energy transition outlook and policies 2030/2050

In November 2017, the Italian Government released its National Energy Strategy (NES), a document looking beyond 2030. Some of the main targets of the NES are: 1) reducing final energy consumption by a total of 10 Mtoe by 2030; 2) reaching a 28% share of renewables in total energy consumption by 2030, and a 55% share of renewables in electricity consumption by 2030; 3) strengthening supply security; 4) narrowing the energy price gap with the EU; 5) supporting sustainable public mobility and eco-friendly fuels; 5) phasing out the use of coal in electricity generation by 2025; 6) Increasing public resources allocated for research and development of clean-energy technologies. More details are available here: http://www.sviluppoeconomico.gov.it/images/stories/documenti/BROCHURE_ENG_SEN.PDF.

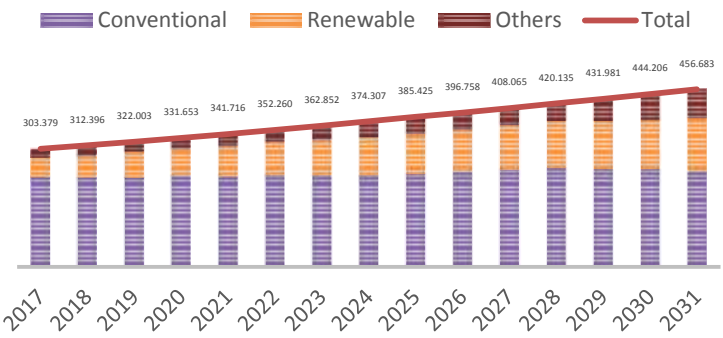
Japan

Country	Japan
Selected Renewable Energy Plan/Programme	The Fukushima Plan for a New Energy Society
Date of implementation	September 7, 2016
Enforcement authority	Ministry of Economy, Trade and Industry and relevant offices, ministries, and agencies, etc.
Goals and estimated results	A model of a new energy society will be created in Fukushima.
Brief summary of policy/programme design	The three main components of the plan are: Expanded introduction of renewable energy; Model construction for realizing a hydrogen-based society; and building smart communities. In the "Fukushima prefecture Vision for Promoting Renewable Energy" of March 2012, the goal was set of supplying 100% of primary energy demand in Fukushima Prefecture from renewable energy by around 2040. To accelerate these efforts, and further strengthen support for energy industry recovery in Fukushima, the government, prefecture, private industry, and other stakeholders work as a team. For further details: http://www.enecho.meti.go.jp/category/saving_and_new/fukushima_vision/pdf/fukushima_vision_en.pdf
Multidimensional impacts	To serve as support for recovery from the Great East Japan Earthquake
Economic and financial impacts	unknown
Environmental safeguards	CO2 emissions reduction

Country	Japan
Selected Renewable Energy Plan/Programme	Basic Hydrogen Strategy
Date of implementation	December 26, 2017
Enforcement authority	Ministry of Economy, Trade and Industry and relevant offices, ministries, and agencies, etc.
Goals and estimated results	Accomplishment of a world-leading hydrogen-based society
Brief summary of policy/programme design	As the world's first national strategy of hydrogen, the Basic Hydrogen Strategy demonstrates the direction or vision for realising a hydrogen-based society with an eye on 2050 and provides an action plan for its realisation. In order to make hydrogen to be a new energy alternative, the strategy aims for making hydrogen affordable and cost-competitive as much as conventional energy sources such as natural gas. Through achieving a carbon-free society under the strategy, Japan will present hydrogen to the rest of the world as a new energy choice and will lead global efforts for establishing a carbon-free society utilizing Japan's technologies. For further details: http://www.meti.go.jp/english/press/2017/pdf/1226_003a.pdf
Multidimensional impacts	To serve as the vision for the common target that public and private sectors should pursue together
Economic and financial impacts	unknown
Environmental safeguards	CO2 emissions reduction

Mexico

Mexico	
Energy Transition Act	
Actual Renewable Energy Installed capacity (GW, large hydropower is excluded): 2016	5.9 GW (Wind, Solar, Geothermal and bioenergy)
Actual Renewable Energy production (GW, large hydropower is excluded): 2016	18,334.8 GWh (Wind, Solar, Geothermal and bioenergy)
Share of Actual Renewable Energy within the power mix (per cent, large hydropower is excluded)	5.4 % (generation); 12.03 % (installed capacity).
Date of implementation	December 2015
Enforcement authority	Secretariat of Energy
Goals and estimated results	The Law of Energy Transition requires gradually increasing the participation of clean energies in the power generation industry, in order to meet the goals set in the Law and in the *Transition Strategy to Promote the Use of Cleaner Technologies and Fuels*: *Percentages of participation of clean energy*  Source: 2016, *Transition Strategy to Promote the Use of Cleaner Technologies and Fuels*, SENER. Between 2017 and 2031 the power generation will increase for an average annual growth rate of 3.0%. In 2031 the participation of renewable energies will be of 30% of total power generation mainly from Solar and Wind Energy.

Mexico	
Energy Transition Act	
	Electricity Generation Mexico 2017-2031 (gigawatts/hour)  Source: Electricity Sector Outlook 2017-2031, SENER Note: Renewable Energies includes large Hydropower. Other includes Nuclear, bioenergy and efficient cogeneration.
Brief resume of policy/measure design	Wholesale electricity market. This market began operations in 2016 and empowers customers to choose and purchase electricity with the best conditions of price, quality and service. Long-term clean power auctions. Market instrument designed based upon international best practice that ensures demand for several years and provides certainty to private investment (the first three auctions resulted in 8.6 billion US dollars of investments, and the most competitive prices for solar power globally). These auctions will add 7,000 MW of clean energy power in the short term, and have set one of the most competitive prices for clean energy competing directly with conventional fossil fuel based technologies: • 48.78 dollars per MWh, in the first auction. • 33.47 dollars per MW, in the second auction. • 20.57 dollars per MW, in the third auction. Clean energy certificates. This policy instrument guarantees that market participants consume a minimum of clean energy and provides certainty for demand increase with a progressive goal: 5.0% in 2018, 5.8% in 2019, 7.4% in 2020, 10.9% in 2021, and 13.9% in 2022. Independent system operator. To ensure open access and an adequate operation of the wholesale electricity market, the Reform also considered the creation of the National Centre of Energy Control (CENACE, by its Spanish acronym). Strengthening of the regulatory body. The Energy Regulatory Commission (CRE, by its Spanish acronym) was endowed with technical, financial and operational independence to ensure that

Mexico	
Energy Transition Act	
	the rules of the game reinforce the market model, promote competitiveness, and guarantee compliance of the renewable portfolio standards. To facilitate investor decisions, we implemented the platforms to identify the availability of renewable resources in the country: through the National Inventory of Renewable Energies and the Atlas of Renewable Energies. Public policy consolidation. SENER reaffirms its mandate to work towards energy security and environmental sustainability, specially through the renewable portfolio standards.
Beneficiaries	Consumers, industry and government.
Multidimensional Impacts (e.g. social, labour and technological development impacts)	Social, economic and technological development impacts
Economic and financial impacts (e.g. Tax/financial incentives for developers; public budget; estimated cost of policy/measure)	With the implementation of the Energy Reform, we designed a competitive market throughout the value chain, which together with innovative public policy and regulation are driving the transition towards a low carbon future, with a gradual increase in the use of clean technologies, which strengthen the competitiveness of the economy, promote regional development and, at the same time, contribute to reducing the environmental footprint of the sector.
Environmental safeguards	

Mexico	
Long term clean energy auctions	
Date of implementation	As of 2015
Enforcement authority	Secretariat of Energy (SENER), Energy Regulatory Commission (CRE)
Goals and estimated results (e.g. in terms of share of RE)	Mexico has ambitious goals within its new energy legal framework for clean power generation, aiming to reach 25% by 2018, and 35% towards 2024.
Brief summary of policy/programme design	In 2018, Mexico is carrying out its fourth long term power auction to boost the deployment of renewable and clean energies like solar, wind, geothermal and hydro. The energy and capacity which is assigned through auctions are contracted for a 15 years' period at highly competitive prices. This is an annual process which will contribute to achieve the national clean energy goals established by the Energy Transition Law.

Mexico	
Long term clean energy auctions	
Beneficiaries	Due to the high-quality of renewable resources in Mexico among other factors, the energy prices obtained from the long term clean energy auctions have been among the most competitive in the World. As a result, Mexico has achieved a significant increase in the renewable energies market share, so the final consumers will get benefits as the energy mix evolves towards a more diverse and liquid electricity market. We expect that in the next years there will be more suppliers using new alternatives for energy sources like solar, wind, geothermal, bioenergy and hydro power plants throughout the country.
Multidimensional impacts (e.g. social, labour and technological development impacts)	The deployment of new clean power plants will foster the development of several productive chains and national content.
Economic and financial impacts (e.g. Tax/financial incentives for developers; public budget; estimated cost of policy/measure)	The main economic benefits are the lower energy prices that has been obtained from the previous auctions (an average of 34 USD/MWh).
Environmental safeguards	The Secretariat of Environment and Natural Resources (SEMARNAT) conducts the national environmental policy which includes the Environmental Impact Assessment among other requirements and authorizations.

Netherlands

The Netherlands	
Offshore wind energy Programme	
Date of implementation	2013
Enforcement authority	Ministry of Economic Affairs in co-operation with Ministry for Spatial Planning and Environment and Ministry for Agriculture, Ecology and Fisheries
Goals and estimated results (e.g. in terms of share of RE)	• Goals: 3500 MW offshore wind energy by 2023, 40% cost reduction in 2023 for average offshore wind park • Results: By 2018 permits for 3 wind parks for 700 MW have been issued with tender procedures. Next 2 windparks for 700 MW each will be tendered in 2018 and 2019. • Dramatic cost reduction from € 150/Mwh to approx. € 40/Mwh.
Brief summary of policy/programme design	Government and industry jointly defined starting points: 1. Swift roll-out to increase renewable energy capacity offshore 2. Level playing field 3. Balance between risks and required pre-investments 4. Optimal balance in role of government and market 5. Low costs for Netherlands tax payers Government takes a proactive role: • Introduces dedicated legal framework • Defines wind farm zones • Performs consenting • Provides grid connection (via TSO: TenneT) • Provides site data • Puts wind farms on the market with tenders for permit (and subsidy if needed) Tender characteristics • Strict requirements for quality and track record • Flexibility in technology to be proposed • Selection methods • With subsidy: - Bid based on strike price • Without subsidy: - Auction (proposal) - Comparative assessment • Bank guarantee provided by winner to ensure construction Main factors influencing strike price

The Netherlands	
Offshore wind energy Programme	
	1. Technology factors (innovation within industry) 2. Market factors (maturing industry) 3. Policy factors (introduction competition, visibility for supply chain, derisking industry, introduction possibilities for economies of scale en standardisation) 4. Finance factors (low interest rates)
Beneficiaries	• Dutch society (pays for subsidies) • Industry (provides work throughout the supply chain, outlook for much more offshore wind parks due to cost reduction) • Climate (offshore wind energy is now a cheap and major resource for climate change mitigation and sets the barrier for other sustainable technologies)
Multidimensional impacts (e.g. social, labour and technological development impacts)	Already mentioned
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	Already mentioned
Environmental safeguards	Strict rules are enforced concerning protection of the ecology by the permits.

Republic of Korea

Republic of Korea	
Renewable Energy 2030 Implementation Plan	
Date of implementation	19th December, 2017
Enforcement authority	Ministry of Trade, Industry and Energy (MOTIE)
Goals and estimated results (e.g. in terms of share of RE)	○ 20% of renewable power generation by 2030. ✓ More than 95% of new capacity (48.7GW): PV(30.8GW) & Wind (16.5GW).
Brief summary of policy/programme design	○ Supporting citizen participations. ✓ Expanding subsidy and incentive programmes for self-consumption solar PV in urban area. ✓ Promoting small-scale projects and co-ops. ✓ Encouraging agricultural solar PV projects by deregulations and incentives. ○ Supporting planned large-scale project led by local govt. or public & private institutions. ○ Supporting RD&D for strengthening competitiveness of renewable energy industry.
Beneficiaries	Citizen, renewable power generation company and renewable energy manufacturing company
Multidimensional impacts (e.g. social, labour and technological development impacts)	○ Supporting Energy New Biz technology development such as DG, AI, IoT, cloud computing and big data based on accelerated deployment of renewable energy and fostering global leading companies to expand overseas. ○ Creating jobs in renewable energy and smart energy infrastructure businesses.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	○ $92 billion (including $18 billion of government budget) of new capacity investment by 2030 (public $51 billion + private $41 billion)
Environmental safeguards	○ Implementing a planned estate system by local govt. for prevention of unsustainable development. ○ Establishing recycling center for waste solar module by 2020 and developing disposal laws for large-scale wind blades.

Singapore

Singapore	
Regulation Reduction	
Date of implementation	2014
Enforcement authority	Energy Market Authority of Singapore
Goals and estimated results	Facilitate the entry of solar PV into Singapore's electricity market in a fair and sustainable manner, while keeping pace with evolving business models and innovations. Initiatives will reduce Singapore's carbon emissions and reliance on imported fuel while supporting our aim of raising solar adoption to 1 gigawatt peak beyond 2020.
Brief summary of policy/programme design	Review and streamline existing regulations that were based on traditional models of large, centralised generators to facilitate the entry of small, distributed solar installations. Examples of reforms include: • Providing consumers with the option to adopt the Solar Generation Profile instead of installing physical meters to measure the amount of solar energy generated. This will lead to cost savings for consumers. • Introducing an Enhanced Central Intermediary Scheme to streamline market registration process and making it easier for consumers to receive payments for injecting solar energy into the grid. • Establishing a simplified market registration process for consumers who install solar systems for self-consumption.
Beneficiaries	Industry and household consumers.
Multidimensional impacts	Build up Singapore's solar PV ecosystem which in turn fosters new and innovative market-driven business models.
Economic and financial impacts	Build up the solar industry in Singapore by adopting polices that support its wider deployment. Singapore believes in pricing energy right to incentivise efficient use of energy and avoid wasteful consumption. In that regard, there are no feed-in tariffs for renewable energy. Instead, our approach is to enhance the regulatory framework to make it easier

	for alternative energy options to enter the market on a commercial basis.
Environmental safeguards	N.A

South Africa

Republic of South Africa	
Renewable Energy Plan, RSA	
Date of Implementation	South Africa's renewable energy plan was launched following the promulgation of the Integrated Resource Plan (IRP) in year 2010.
Enforcement Authority	The Department of Energy is empowered through the Electricity Regulation Act, Act 4 of 2006 (herein referred to as ERA) to determine and procure new electricity generation capacity for the country in line with the Integrated Resource Plan (IRP). The IRP takes into account South Africa's commitment to the reduction of CO_2 emissions. The National Energy Regulator of South Africa (NERSA) which regulates the energy sector licences new power generation plants in line with the IRP as determined by the Minister of Energy in terms of Section 34 of the ERA
Goals and estimated results	The South African National Development Plan (NDP) identifies the need for South Africa to invest in a strong network of economic infrastructure designed to support the country's medium and long-term economic and social objectives. Energy infrastructure is a critical component that underpins economic activity and growth across the country. The Integrated Resource Plan (IRP) 2010 developed the preferred energy mix with which to meet the electricity needs over a 20 year planning horizon to 2030. In line with the commitment in the National Development Plan (NDP) to transition to a low carbon economy, 17,800 MW of the 2030 target is expected to be from renewable energy sources, with 5,000 MW planned to be operational by 2019 and a further 2,000 MW (i.e. combined 7,000 MW) operational by 2020. The IRP 2010 is currently under review and depending on projected electricity demand the projections above will be adjusted accordingly.
Brief Summary of	South Africa's policy on renewable energy goes back

Policy/Programme	as far as year 1998 when a White Paper on Renewable Energy was released. The White Paper on Renewable Energy had set a target of 10 000GWh of energy to be produced from renewable energy sources (mainly from biomass, wind, solar and small-scale hydro) by 2013. The White paper was followed by the promulgation of the Integrated Resource Plan (IRP) in year 2010. The IRP 2010-30 contains a plan for 17,800 MW to come from renewable energy by year 2030. South Africa's electricity supply industry has historically been a monopoly with state owned utility (Eskom) generating, transmitting and distributing electricity. In some areas municipalities also distribute electricity. The rollout of renewable energy in line with the IRP was the South African government formal initiative to introduce private players in electricity generation. The Renewable Energy Independent Power Producer Procurement (REIPPP) Programme was launched to the market in 2011. The national electricity utility (Eskom) is mainly designated as the buyer of the electricity determined by the Ministry of Energy to be procured from Independent Power Producers (IPPs). To date the Minister of Energy has determined that 14725 MW of new generation capacity be procured from renewable sources and IPPs The REIPPP programme is implemented through auction rounds referred to as "Bid Windows". The programme is rolled out in line with the rules and guidelines contained in the New Generation Regulations. These guidelines include: • compliance with the IRP; • the acceptance of a standardised power purchase agreement (PPA); • a preference for a plant location that contributes to grid stabilisation and mitigates against transmission losses; • and a preference for a plant technology and location that contributes to local economic development. The contracts between the utility and the independent generators are a "take or pay" with the costs passed

	through to the consumer in terms of Section 10 of the New Generation Regulations that allow the utility (Eskom) to recover all the cost associated with the REIPPP through the electricity tariff. Eskom is further supported through the Government Support Framework Agreement that provide government support in the event that Eskom is unable to honour the commitments. The programme to date procured at least 6422MW across different technologies such as wind and PV, biomass, landfill gas, small hydro and CSP. At 31 March 2018, sixty two (62) projects are operational and delivering 3773MW into the grid. The balance is still in construction. During April 2018, additional 27 projects were signed. The bulk of these projects will connect to the grid in 2020/21 adding another 2305 MW.
Multidimensional impacts (e.g social, labour, and technological impacts)	The programme had positive contribution to local communities. All projects are required to contribute at least 1.5% of the revenue to the local community whilst it is also mandatory for the community to have a minimum of 2.5% shareholding in the project. The revenue from the operational projects are being spent on education, health, social welfare and enterprise development. The programme has created much needed jobs in remote rural areas where in the past economic activity was non-existent. Members of local communities receive training not only for the renewable energy sector or other sectors as well. The projects also provide bursaries to students coming from the local communities. More people have better understanding of the renewable technology and some members of the communities have managed to acquire necessary skills to manage and maintain the Wind and PV technologies. The acquired skills are also useful in various sectors such as the rollout of Solar Water Programme.
Economic and Financial Impact	The 112 projects procured to date under the REIPPP amounts to ZAR201 billion of investment into the South African economy. . The private sector is required to bid a tariff and that tariff is used to sell electricity to the national utility. The tariffs can only increase with CPI in terms of the rules of the Power Purchase Agreements

	(PPAs) entered into with Eskom. In the event that Eskom is unable fulfil its obligations under the PPA, the government will provide support to Eskom in terms of the GSFA. These support obligation is reflected as contingent liabilities on the balance sheet of the country. The contingent liabilities reduces year on year as the projects services their debt obligations and pay dividends over the term of the PPA.
Environment Safeguards	The programme had positive impact on the environment in terms of carbon emission reduction. It is estimated that the programme manage to reduce approximately 22.5 million tonnes of CO^2 since inception to June 2017 This represents about 37% of the total annual reduction of 20.5 million tonnes of CO^2. The programme also reduced the water demand for the energy sector. The current operational projects are estimated to save about 24.2 million kilo litres of water per annum.

Turkey

TURKEY	
Policy/Measure for Renewable Energy	Renewable Energy Zone (RE-ZONE)
Date of Implementation	2017
Enforcement Authority	Ministry of Energy and Natural Resources (MENR)
Goals and Estimated Results	Turkey has recently introduced RE-ZONE business model and made two auctions each 1 GW capacity based on solar and wind energy. The business model is aimed at the following: - Utilization of renewable energy resources effectively and efficiently by creating large scale RE-ZONE on public, treasure and private estates, - To attract investments with clear road maps, rapid realisation of investments by allocation these areas to investors, easy permits/ procedures and licensing processes, - Joint action with the investor and public, - Ensure sustainability of the investments with R&D incentives, - Create synergy with technology suppliers, multinational manufacturers and contractors. The auction's local content requirement is designed as a win-win basis for manufacturers. Turkey is offering its logistical advantages, skilled man power, existing industrial capabilities and financial stability among the other countries in the region.
Brief Resume of Policy/Measure Design	**First RE-ZONE Solar Auction:** Karapınar RE-ZONE is 19.19 km^2 and 1000 MW installed power and 1700 GWh of annual electricity production can be provided by solar power plants. The Kalyon-Hanwha Q-Cells consortium won the auction bid on March 20, 2017 for the construction of Turkey's biggest solar power plant in Karapınar, in the Central Anatolian region of Turkey, at a cost of USD cent 6.99 per kilowatt hour for 15 years. The photovoltaic solar module production factory, which will produce the equipment for the Karapınar RE-ZONE

TURKEY	
Policy/Measure for Renewable Energy	Renewable Energy Zone (RE-ZONE)
	power plant, will be constructed in the following 21 months after the signature of the agreement. **Second RE-ZONE Wind Auction:** The Consortiums of Turkish and international companies submitted a total of eight final bid offers for Turkey's 1,000 megawatts of wind power for the RE-ZONE Project on July 27, 2017. Siemens - Turkerler - Kalyon consortium won the first wind auction offered by Turkey's RE-ZONE Project on August 3, 2017. The consortium offered the lowest price at $3.48 per kilowatt-hour of electricity production. The consortium will construct a wind turbine factory in Turkey in the next 21 months, following the signature of the agreement. Up to 450 wind turbines, each with a minimum capacity of 2.3 megawatts will be manufactured at the factory. The RE-ZONE wind projects aim to generate approximately 3,000 gigawatt-hours of electricity per year, powering 1.1 million homes annually.
Beneficiaries	Private Sector
Multidimensional Impacts	The tenderers are requested local production of equipment and stipulated that local engineers should constitute 80% of employment in the project.
Economic and Financial Impacts	RE-ZONEs will enable the country to install high wind and solar capacity at a cost of around $2.4 billion.
Environmental Safeguards	RE-ZONEs will avoid 2.3 million tonnes of carbon emissions each year.

United Kingdom

United Kingdom	
Contracts for Difference (CfD)	
Date of implementation	The initial version of the Contracts for Difference (CfD) renewable energy support scheme was launched in March 2013.
Enforcement authority	The Department for Business, Energy & Industrial Strategy, a Ministry of the UK Government. Projects receiving income support receive a contract with the independent Low Carbon Contracts Company (a private entity that is Government-owned), and enforcement provisions are within the scope of UK general contract law.
Goals and estimated results (e.g. in terms of share of RE)	The CfD scheme was introduced as part of a major effort to reform the way UK electricity markets supported low-carbon and renewable energy projects, and it has become the main UK mechanism for supporting new large-scale renewable energy generation. The form of support was designed to provide a degree of income stabilisation, which makes new projects that have high up-front capital costs, but long lifetimes and low operational costs, more attractive to invest in, while remaining compatible with the established competitive market structures in the UK. An important consideration was how to introduce competitive tension in the renewable energy sector, to support a longer term move away from subsidy. CfD contracts are therefore awarded in a series of competitive auctions based on the cost of energy produced, with only the lowest price bids being successful. It is worth noting that projects using various different renewable technologies compete directly with each other on the basis of price, which was a new and innovative concept at the point where it was first introduced. The scheme has been a success, delivering substantial new investment while also helping deliver significant reductions in the costs of some renewable technologies, in particular offshore wind. The first and second CfD auctions secured 2.1GW and 3.3GW of renewable generation respectively. CfD auctions (and bespoke contracts of a similar nature that were briefly offered as a precursor to the introduction of competitive auctions), have together secured 7.5GW of offshore wind, with potential to save over 5 million tonnes of carbon a year.
Brief summary of policy/programme design	A CfD is a private law contract between a low carbon electricity generator and the Low Carbon Contracts Company, a Government-owned company. The contract provides a fixed income on a £-per-Megawatt-hour basis over a 15-year term (for projects that would typically have a total operating lifetime of 25 years); the level of income is the 'strike price' and developers compete in auctions on the basis of how low a 'strike price' they can accept.

United Kingdom	
Contracts for Difference (CfD)	
	Projects still sell power in to the UK electricity market like other generators. However, if the wholesale electricity price is below the 'strike price', the generator will receive a top-up payment to make up the difference, which is ultimately recovered from electricity consumers. If the wholesale price is above the contract price, the generator pays any surplus back to the consumers.
Beneficiaries	The developers and operators of new electricity generation projects in the UK that produce low-carbon electricity.
Multidimensional impacts (e.g. social, labour and technological development impacts)	Sustained support for clean energy via the CfD, by providing a forward market coupled with systemic pressure to improve efficiency and cut costs, has led to dramatic falls in the costs of renewable technology, with the most notable impact being in the previously high-cost offshore wind sector where increased scale and improved turbine efficiency have had a particularly marked effect. The 2017 auction secured 3.2GW of offshore wind capacity at around half the price of first auction back in 2015. The CfD has also been an important indirect factor in developing the industrial supply chain in offshore wind. Projects of 300 MW or above must have a supply chain plan, which has been approved by the Government, before they can enter a Contract for Difference auction. The supply chain plan sets out what actions the project will take to encourage the development of open and competitive supply chains and the promotion of innovation and skills. In introducing the CfD scheme, the UK created the world's largest offshore wind market (with 43% of Europe's offshore wind deployment to date[1]), creating thousands of skilled jobs and supporting hundreds of millions of pounds worth of investment, this is believed to have significantly improved the industrial capabilities of the sector.
Economic and financial impacts (e.g. tax/financial incentives for developers, public budget, estimated cost of policy/programme)	The CfD mechanism, when initially introduced, provided a significant net subsidy as an incentive to developers. However, as the 'strike price' approaches market costs, the mechanism remains significantly attractive to developers due to the income stabilisation it brings during the initial years of operation of low carbon projects, where construction debts are being amortised. The UK Government uses competitive auctions to secure clean electricity to ensure value for money consumers, and the cost of successive auctions is gradually reducing as renewable technologies have developed and the costs of projects have fallen. As an illustration of the scale of costs currently involved, the second auction round for CfD contracts is projected to add around £2 to £3 (sterling) to the average annual household bill.

[1] WindEurope, *Offshore Wind in Europe: Key trends and statistics 2017*

<table>
<tr><th colspan="2">United Kingdom</th></tr>
<tr><th colspan="2">Contracts for Difference (CfD)</th></tr>
<tr><td></td><td>In order to keep costs of renewable electricity financial incentives to a minimum, the UK has committed to a cap on total Low Carbon Levies, covering the CfD, as well as previous legacy schemes and any new schemes. The forecasted total costs (in billions of £ sterling) of the CfD are as follows:
<table>
<tr><th>2016 - 2017</th><th>2017 - 2018</th><th>2018 - 2019</th><th>2019 - 2020</th><th>2020 - 2021</th><th>2021 - 2022</th><th>2022 - 2023</th><th>2023 - 2024</th><th>2024 - 2025</th></tr>
<tr><td>0.1</td><td>0.6</td><td>1.1</td><td>1.6</td><td>2.1</td><td>2.3</td><td>2.4</td><td>2.5</td><td>2.5</td></tr>
</table></td></tr>
<tr><td>Environmental safeguards</td><td>It is an explicit prerequisite that developers wishing to compete in CfD auctions must provide evidence that they secured all applicable planning consents.</td></tr>
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