# EU-INDIA CLEAN ENERGY AND CLIMATE PARTNERSHIP

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# Foreword

The European Union attaches the highest importance to the cooperation with India in the area of clean energy and climate action.

The EU and India are both working towards a clean energy transition, to become less dependent on energy import and to increase energy security, reliability and affordability of the energy supply. We are strongly committed to increasing energy efficiency and the share of renewable energy in our overall energy mix. We are strongly committed to tackle the challenge of climate change and to implement the Paris Agreement.

**The EU is keen on working with India, on bringing together our policy makers, researchers, businesses and stakeholders to exchange information and to learn from each other.**

With the European Green Deal, Europe has put clean energy and climate action at the top of its domestic and external agenda.

The EU is keen on cooperating and coordinating with India in international and multilateral climate and energy fora. We are both significant importers of energy, large economies and democratic societies.

The EU and India recognize climate change as one of the key threats to be addressed urgently by the international community. Science tells us that it is time to act.

The EU strategy on relations with India adopted in November 2018 proposes several concrete activities, aiming at making our energy and climate cooperation even stronger to face global challenges.

I trust that this brochure will serve as a useful reference for the energy and climate community working in India and in the European Union.

**Ugo Astuto**

Ambassador of the European Union to India

# The European Union Key Facts*

**Population (2019): 446 million**

**Population density (2017): 108 persons/km²**

**Land area (2016): 4 million km²**

**GDP (2018): €13.48 trillion**

**GDP per capita (2018): €30,160**

The European flag features a circle of 12 gold stars on a blue background. They stand for the ideals of unity, solidarity and harmony among the peoples of Europe. The European flag symbolises both the European Union and, more broadly, the identity and unity of Europe.

*As per latest figures from Eurostat for EU27

+ The European Union (EU) is an economic and political union of 27 EU countries;
+ The EU has developed an internal single market through a standardised system of laws that apply in all Member States. EU policies aim to ensure the free movement of people, goods, services, and capital within the internal market;
+ The Member States delegate sovereignty to the EU institutions to represent the interests of the European Union as a whole. There are common policies for trade, agriculture, energy, environment, fisheries, competition, research, external relations and regional development;
+ The EU's main bodies are: the European Parliament, the Council of the European Union, the European Commission, and the European Court of Justice;
+ The guiding values of the EU include human dignity, freedom, democracy, equality, rule of law, and human rights;
+ The EU has delivered more than half a century of peace, stability and prosperity, helped raise living standards and launched a single European currency: the euro. More than 340 million EU citizens in 19 countries now use it as their currency and enjoy its benefits;
+ The EU is the largest trade bloc in the world, and the biggest exporter of manufactured goods and services and the biggest import market for over 100 countries;
+ The EU has a diverse and rich culture, with 24 official languages and over 60 indigenous regional or minority languages;
+ Collectively, the EU and its constituent countries is the world's leading donor of humanitarian aid;
+ In 2012, the EU was awarded the Nobel Peace Prize for advancing the causes of peace, reconciliation, democracy and human rights in Europe;
+ The motto of the EU is "united in diversity" which first came into use in 2000.

# Key Dates

**1950**
On 9th May 1950, French Foreign Minister Robert Schuman gave a speech which publicly proposed the establishment of a European Coal and Steel Community (ECSC).

**1951**
The ECSC is founded by six countries (Belgium, the Federal Republic of Germany, France, Italy, Luxembourg and the Netherlands).

**1957**
The six countries set up the European Economic Community (EEC), for wider cooperation. One of its core objectives is to develop a common market offering free movement of goods, services, capital and people. Border checks and customs duties would be gradually removed.

**1969**
At the Hague Summit, the EEC's political leaders decide to move further ahead with European integration.

**1973**
Denmark, Ireland and the United Kingdom join the European Communities, bringing their membership to nine.

**1986**
Spain and Portugal join the European Communities, bringing their membership to 12.

**1991**
The Maastricht European Council adopts a Treaty on European Union. It lays the basis for a common foreign and security policy, closer cooperation on justice and home affairs and the creation of an economic and monetary union, including a single currency. The inter-governmental cooperation in these fields added to the existing Community system creates the European Union (EU). The EEC is renamed the 'European Community' (EC).

**1992**
The Treaty on European Union is signed at Maastricht. It enters into force on 1 November 1993.

**1993**
The Single Market is created.

**1995**
Austria, Finland and Sweden join the EU, bringing its membership to 15.

**1999**
The currencies of 11 EU countries are replaced by the euro. The single currency is launched on the money markets. From this point onwards, the European Central Bank (ECB) has responsibility for the EU's monetary policy, which is defined and implemented in euro.

**2002**
People in the euro area countries begin using euro notes and coins.

**2004**
Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia join the European Union.

**2007**
Bulgaria and Romania join the EU.

**2013**
Croatia joins the European Union as its 28th member state.

**2020**
The United Kingdom withdraws from the European Union.

# Elements for an EU Strategy on India

The European Union and India upgraded their long-standing relationship to a strategic partnership in 2004, acknowledging their common goals and principles. Nowadays, in a challenging international environment, the EU and India share the same values of democracy, human rights, fundamental freedom and support the rule-based global order.

Pursuant to this, in November 2018, the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy adopted a Joint Communication that sets out the EU's vision for a strategy to strengthen cooperation and the partnership with India. Through the strategy, the EU places an emphasis on reinforcing cooperation in foreign policy and developing security and defence cooperation with India, promoting effective multilateralism, and building on common values and objectives.

This Joint Communication replaces the last Commission Communication on India of 2004, recognising that India has emerged as the fastest-growing large economy and has acquired an important geopolitical role.

> **The Strategy aims to strengthen the EU-India Strategic Partnership by focusing on sustainable modernisation and on common responses to global and regional issues, and will provide the policy framework for the EU's deeper and broader engagement with India over the coming years.**

## EU-India: Partners in Progress

### MODERNISATION

+ Investment in India's sustainable modernisation
+ New business opportunities
+ Enhanced connectivity and data protection
+ Sustainable urbanisation

### ENVIRONMENT, ENERGY AND CLIMATE CHANGE

+ Implementation of the Paris Agreement
+ Clean energy transition, energy efficiency and renewable energy
+ Addressing major environmental challenges
+ India-EU Water Partnership
+ Joint Declaration on Resource Efficiency

### TRADE & INVESTMENT

+ Balanced, ambitious and mutually beneficial agreements on trade and investment
+ Sound, transparent, non-discriminatory regulatory and business environment in India

### INNOVATION

+ More people-to-people exchanges, utilising societal diversity
+ Cooperation on education and skills, mutual recognition of qualifications, mobility of talent
+ Innovation initiatives

## Strengthening the Political Partnership

### REINFORCING COOPERATION ON FOREIGN POLICY

+ Coordinating on the most relevant foreign policy issues
+ Working for stability and security in the overlapping neighbourhoods
+ Engaging India more on sustainable connectivity both at strategic and operational levels
+ Sustainable urbanisation

### DEVELOPING SECURITY AND DEFENCE COOPERATION

+ Fighting terrorism and radicalisation
+ Exchanging expertise on maritime and cyber security, non-proliferation / disarmament and hybrid threats
+ Military relations via personnel exchanges and trainings

### PROMOTING EFFECTIVE MULTILATERALISM

+ Promoting the rules-based global order and trading system
+ Improving coordination in the United Nations, World Trade Organisation and G20
+ Working on strong, sustainable, balanced and inclusive global growth

### BUILDING ON COMMON VALUES AND OBJECTIVES

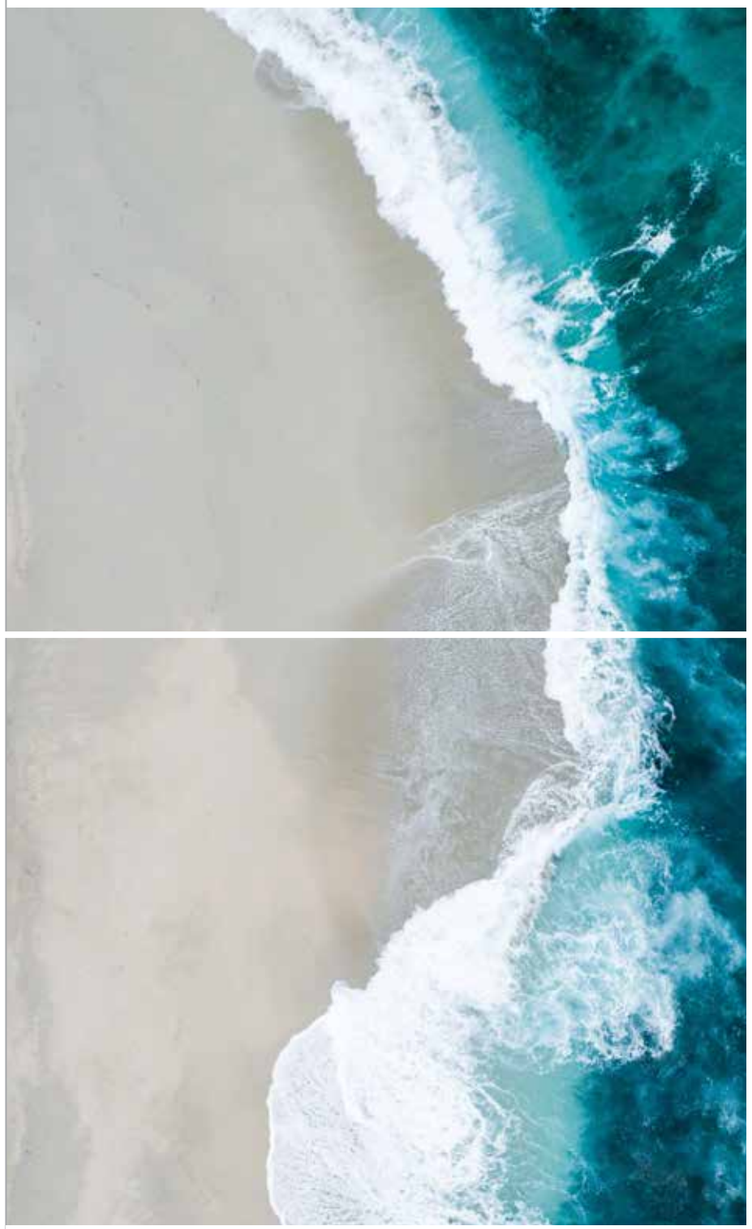
+ Promoting gender equality and women's empowerment, human rights and democracy, and the inclusion of young people
+ Coordinating on humanitarian and disaster relief operations
+ Delivering the UN Sustainable Development Goals and Agenda 2030

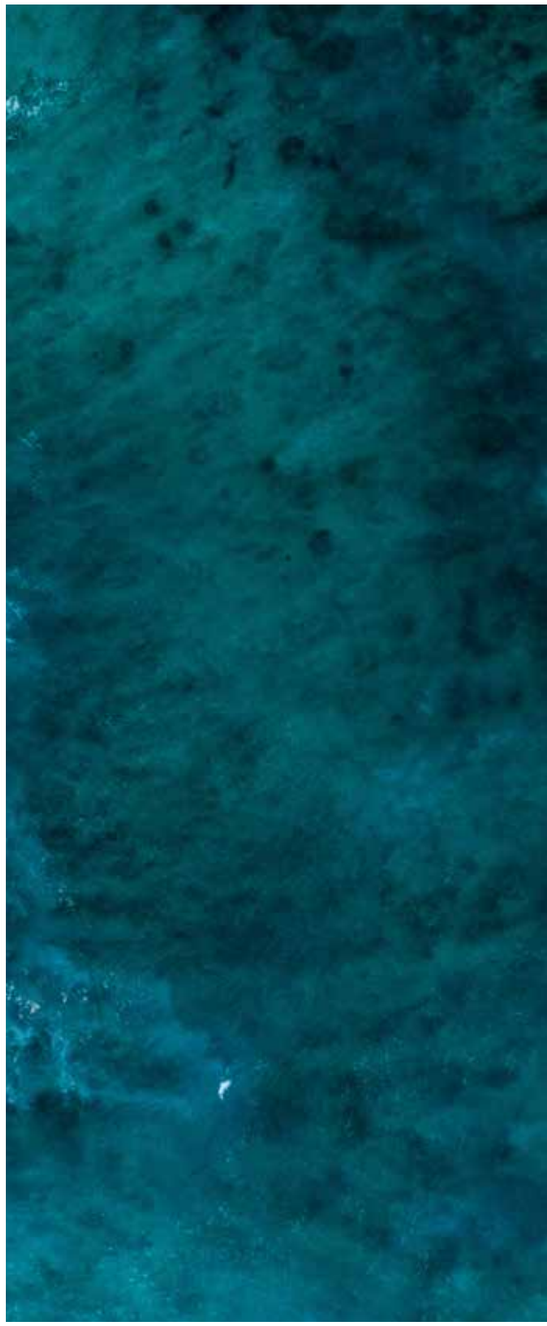
**1.**
The EU is India's first trading partner with trade in goods and services crossing €125 billion

**2.**
6,000 EU companies established in India employing (direct and indirect) 6 million people

**3.**
The European Investment Bank (EIB) has invested €2.5 billion in infrastructure, renewable energy and climate projects

**4.**
There are currently around 50,000 Indian students studying in Europe





# Clean Energy and Climate Action in the European Union



## Introduction

In December 2019 the European Commission proposed the European Green Deal, which is a new growth strategy aiming at ensuring a resource-efficient and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. Further decarbonising the energy system will be crucial to reach the climate objectives in 2030 and 2050.

Moving from fossil fuels towards a decarbonised system, completing the Energy Union and the clean energy transition will be of paramount importance for the modernisation of the European economy. This transition is a clear opportunity to boost investment, growth and jobs in Europe, while still ensuring a fair and just transition.

In 2009, the EU set ambitious energy and climate targets for 2020: a 20% greenhouse gas emission reduction, 20% in renewable energy and 20% energy efficiency. These targets set a clear sense of direction which drove investment in infrastructure, research and innovation. Ten years later, the EU is broadly on track to achieve these objectives.

> **It proves to be possible to reduce emissions and to achieve GDP growth and a net increase in employment in the energy sector. Renewable energy in Europe has become much cheaper.**

Solar and wind power now compete on market terms with other forms of power generation.

With the 2015 Paris Agreement, the EU has pledged to move further ahead and achieve greenhouse gas emission reductions of at least 40% by 2030. To respond to this challenge, the EU has adopted a set of ambitious new rules, defining the legislative parameters for the coming years, but also enabling the necessary investment. This new rulebook is called the “Clean Energy Package for all Europeans”.

## Clean Energy Package for all Europeans

The “Clean Energy Package for all Europeans” has the following key elements:

**1.**

**Energy efficiency first:** The new norms contain the principle of “energy efficiency first”, and set a target to be 32.5% more efficient in our energy use by 2030. A particular emphasis is given to improving energy performance in the building sector.

**2.**

**Showing leadership in the take-up of renewables:** An ambitious new target of at least 32% by 2030 of the European Union’s gross final consumption of energy, which is broader than the energy consumed by the power sector. It includes all energy delivered to industry, transport, households, services including public services, agriculture, forestry and fisheries, the consumption of electricity and heat by the energy branch for electricity, heat and transport fuel production, and losses of electricity and heat in distribution and transmission. This will drive an acceleration of clean energy uptake in all sectors, and new laws to support public and private investment in the years ahead.

**3.**

**A new energy rulebook:** While the binding targets are fixed at EU level, the new rules establish that each country will decide how it contributes to these EU objectives by drafting a National Energy and Climate Plan (NECP) for 2021-2030. The draft plans will be evaluated by the European Commission to ensure that the EU can collectively meet its Paris Agreement commitments. The national plans also require the EU countries to outline a long-term strategy for at least the next 30 years. The new rules provide a stable enabling framework that will facilitate and encourage private investment in the clean energy transition.

**4.**

**More rights for consumers:** Besides strengthening consumer rights - more transparency in household bills, greater choice and more flexibility to change supplier - the new rules will make it easier for individuals to produce their own energy, for example through solar panels, store it or sell it onto the grid.

**5.**

**Increased security of supply thanks to a smarter and more efficient electricity market:** Constantly adding higher volumes of variable renewables is a challenge. The new laws will increase our security of supply by helping integrate renewables into the grid and manage risks, and by improving cross-border cooperation: this will lead to a cleaner, more stable and more competitive electricity sector across Europe.

# Benefits and Impacts of the Clean Energy Transition

**European Green Deal**

The Clean Energy Package is not the end of the road. It paves the way to 2030 and beyond. With its ambitious targets for 2030 at the EU level, the package puts in place an advanced legislative framework to transform the energy sector and decarbonize the economy. Both the renewable energy target of at least 32% of the EU's gross final consumption of energy and the energy efficiency target of at least 32.5% include the possibility of a further upward revision in 2023.

> **When fully implemented, they could lead to greenhouse gas emissions cut by around 45% at the EU level by 2030.**

The fight against climate change will not stop there. The Intergovernmental Panel on Climate Change has confirmed that urgent acceleration of global climate action is needed. The world will have to go to net zero greenhouse gas emissions by around 2070 to limit temperature increase to 1.5 degrees Celsius. With this in mind and going beyond 2030, the European Commission presented the communication "Clean Planet for all - A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy", looking at all sectors of the economy. The European Green Deal, adopted in December 2019, proposes a set of deeply transformative policies and an increased climate ambition for 2030 in order to achieve the 2050 climate neutrality objective.

**Growth, Jobs and Competitiveness**

The clean energy economy has been growing faster than the overall economy over the past 15 years in the EU. The renewable energy sector already employs 1.4 million people in Europe. Eco-industries represent more than 3.4 million jobs in Europe. These jobs are mainly local jobs where SMEs play an important role, notably in the construction and engineering sectors. As a result of the new package, up to 400,000 additional jobs could come in the energy efficiency sector alone.

Over the next decade, Europe will need around €180 billion a year in investments to improve energy efficiency and increase the production and deployment of renewables. A stable policy environment is therefore essential, one which encourages and accelerates the necessary public and private investment in all key sectors.

> **Higher energy security, more diversification, renewables and energy efficiency, and less dependence on external energy supplies are key priorities.**

The EU currently imports more than half of its energy, mainly in the form of oil and gas. With an external energy bill of roughly €300 billion, the EU has an enormous potential to reduce its imports of fossil fuels and increase its energy sovereignty. Increasing energy efficiency and the deployment of renewables will allow the EU to substantially reduce dependency on external energy suppliers and to increase our resilience to external shocks or political pressure.

**Air quality**

In addition to the economic benefits of the transition, there are clear benefits in terms of improved air quality, particularly in cities. 75% of the European population lives in urban areas. Today, air pollution causes half a million premature deaths annually. By going climate neutral, we can reduce this by more than 40% and save up to €200 million in healthcare costs.

**No citizen, no region should be left behind**

The EU is well aware that it will be difficult for some regions or some sections of society in Europe to benefit from the transition – especially in the short-term. It has therefore launched several initiatives to ensure that all citizens in the EU benefit from the clean energy transition:

**1.**

**Energy Poverty** has been addressed in new legislation. A common definition of the concept has been agreed for the first time. EU Member States are required to monitor the situation in their country. Many of the new elements aimed at strengthening the position of the consumer are aimed at supporting the most vulnerable. In addition, the Energy Poverty Observatory has been established to help Member States in their efforts to combat energy poverty.

**2.**

**The Coal Regions in Transition Initiative** aims to help develop strategies and projects for viable social, economic and technological transformation in regions, which have previously been particularly dependent on coal or carbon-based industries.This will involve retraining and upskilling. The EU is already providing assistance to 13 coal regions in seven Member States.

**3.**

Islands are often highly dependent on imported fossil fuels to generate their energy, but have significant potential to generate much of their own energy through renewables. Consequently, the Commission has established the **Clean Energy for EU Islands Initiative.**

**An interconnected and secure electricity grid, and more flexible and efficient electricity markets are better suited for the energy transition.**

The EU has the most interconnected and secure electricity grid in the world and manages the highest share of electricity generated from renewable energy sources.

Interconnected electricity and gas grids are vital for energy security of supply. Well integrated networks are not only the best contingency in case of a possible infrastructure failure, but they also bring more supply options and hence more competitive prices into the national markets. The new rules introduce a framework for cross-border cooperation and put an emissions cap on new capacity mechanisms to restrict subsidies for the most polluting technologies.

The new electricity market design rules will make the EU electricity market suited to renewable energy. Electricity can be traded closer to real time, when weather forecasts are more accurate and renewable plants are able to better predict their production. The rules strengthen the price signals and increase cross-border trade to ensure that electricity can always flow to where it is most needed.

**Consumers**

With the new rules, consumers have clearer, more transparent energy bills and more understandable contracts. They will have the right to request a smart meter, thus being informed about their energy consumption and costs in real time, with full control over their data, which remains protected. Certified price comparison tools will help them in their choice of supplier. Switching supplies will be easier and faster. Consumers will also find it easier to invest in renewable energy, most obviously in solar panels, and then consume, store or sell the energy they produce. When buying new household appliances, the widely recognised EU energy label is an important tool to help them choose more energy-efficient devices. Saving energy is a sure way to save money on household bills.

**Overview of EU legislation focusing on energy**

» Energy Performance in Buildings Directive

» Renewable Energy Directive

» Energy Efficiency Directive

» Governance Regulation

» Electricity Directive

» Electricity Regulation

» Risk-Preparedness Regulation

» Regulation for the Agency for the Cooperation of Energy Regulators

# Legislation Focusing on Reducing Greenhouse Gas Emissions

## 1.

**EU Emissions Trading System Regulation (ETS):** The EU emissions trading system is the EU's key tool for cutting greenhouse gas emissions from large-scale facilities in the power and industry sectors, as well as the aviation sector. The ETS covers around 45% of the EU's greenhouse gas emissions. The target is to have 21% lower emissions by 2020 in comparison to 2005 from these sectors. For 2030 the EU ETS sectors will have to cut emissions by 43% (compared to 2005). To this end, the ETS has been revised for the period after 2020.

## 2.

**Effort-sharing decision:** covers the sectors not in the ETS, accounting for some 55% of total EU emissions, such as housing, agriculture, waste, transport (excluding aviation). EU Member States have taken on binding annual targets until 2020 for cutting emissions in these sectors compared to 2005. The targets differ according to national wealth – from a 20% cut for the richest countries to a maximum 20% increase for the least wealthy (although they were still projected to have to make efforts to limit emissions). Progress is monitored by the European Commission every year, with each country required to report its emissions. The non-ETS sectors will need to cut emissions by 30% by 2030 (compared to 2005) – this has been translated into individual binding targets for Member States.

## 3.

Measures taken at the EU level will help Member States to **reduce their emissions**. For example

» **In the area of transport:** CO2 emission standards for new cars and vans will cut emissions from road transport. The targets for 2015 (for cars) and 2017 (for vans) were achieved already in 2013. A 37.5% CO2 reduction target for new cars and 31% for new vans has been set for 2030. New rules for Heavy Duty Vehicles will ensure that between 2025 and 2029, new trucks will emit on average 15% less CO2 compared to 2019 emission levels. From 2030 onwards, they will be required to emit on average 30% less CO2. These targets are binding, and truck manufacturers which do not comply will have to pay a financial penalty in the form of an excess emissions premium. The EU legislation also addresses the quality of fuel, including the greenhouse gas intensity.

» **In the area of fluorinated gases:** In October 2016, the Meeting of Parties to the Montreal Protocol on substances that deplete the Ozone layer adopted the Kigali Amendment to add hydrofluorocarbons to the list of controlled substances. The foreseen phase-down of HFCs could save around 80 Gigatonnes CO2 equivalents until 2050 and will significantly contribute to fight climate change. The EU is taking regulatory action to control F-gases as part of its policy to combat climate change. A first F-gas Regulation was adopted in 2006 and succeeded in stabilising EU F-gas emissions at 2010 levels. The current Regulation, which replaces the first and applies since 1 January 2015, strengthens the existing measures and introduces a number of far-reaching changes. By 2030, it will cut the EU's F-gas emissions by two-thirds compared with 2014 levels. Also the completed phase-out of ozone depleting substances, 10 years ahead of the schedule maintained under the Montreal Protocol, contributed to the mitigation of climate change.

### Climate finance and mainstreaming

Meeting the 2030 climate and energy targets will require an additional €180 billion per year in the period 2021-2030; these sums clearly outstrip the resources available from public budgets. The Commission, in its May 2018 Communication on the Multiannual Financial Framework 2021-2027, proposed “climate mainstreaming” across all EU funding programmes, with a target of 25% of the EU’s expenditure contributing to climate objectives.

> **At the time of the proposal, 25% of the overall budget amounted to €320 billion. This should build on the current 20% target for the period 2014-2020, which the EU will largely achieve. Furthermore, as a general principle, all EU expenditure should be consistent with the Paris Agreement objectives.**

That entails that projects should undergo a sustainability test which may lead to the exclusion of projects increasing the long-term dependency on fossil fuels. Another important aspect in this context is the climate proofing of EU-funded infrastructure projects, ensuring their adequate resilience to the adverse impacts of climate change.

The EU budget could support only approximately 5-7% of the total required investment levels for mitigation. Most of the finance needed will have to stem from other public and private sources. To mobilise private climate investments, the Commission adopted in 2018 the EU Sustainable Finance Action Plan aiming at reorienting capital flows towards sustainable investment to achieve sustainable and inclusive growth, managing financial risks stemming from climate change, environmental degradation and social issues, and fostering transparency and long-termism in financial and economic activity.

# EU-India Cooperation in the Area of Clean Energy and Climate Action

Clean energy and climate action are areas in which the objectives of the European Union and India strongly converge. Both the EU and India want to reduce their dependency on energy import, to diversify their energy supply, and to increase energy efficiency and share of renewable energy. Both are strongly committed to the implementation of the Paris Agreement. Therefore, the European Union and India are closely cooperating on ensuring affordable, clean and secure energy and on climate action.

> **The cooperation focuses on the promotion of renewable energy, including offshore wind and solar power, energy efficiency, including of buildings, smart grids and climate action to implement the Paris Agreement.**

### The India-EU Clean Energy and Climate Partnership

At the EU-India Summit on 30 March 2016 the India-EU Clean Energy and Climate Partnership was announced with the aim of reinforcing cooperation on clean energy and implementation of the Paris Agreement by strengthening joint activities for deployment of climate friendly energy sources, including solar and wind energy. This partnership was later reconfirmed in the joint statement at the EU-India Summit on 6 October 2017.

### Climate and Energy in the EU Strategy on India

The importance that the EU attaches to cooperation with India, one of the world’s largest and fastest-growing economies, in the area of clean energy and climate action is reflected in the Joint Communication “Elements for an EU strategy on India” of 20 November 2018 and the Council Conclusions on that strategy of 10 December 2018. With India set to become the most populous country in the world, its energy needs will more than double in the next 20 years. It is currently the world’s fourth largest emitter of greenhouse gases, although the CO2 emissions per capita are very low. The country is also highly vulnerable to climate change and extreme weather, such as heat waves, droughts and floods.

India’s energy mix is currently dominated by coal, but the country has started implementing one of the world’s largest clean energy transition programmes using its renewable energy potential. EU-India cooperation can contribute to delivering reliable, sustainable and affordable energy systems, while at the same time bringing together energy technology sectors from both sides. The EU will further engage with India on energy security, energy efficiency, renewable energy sources, including solar and offshore wind, smart grids and off grid systems, as well as on policies to develop an electricity system which can reliably integrate large shares of renewable energy.

Both sides are fully committed to the implementation of the Paris Agreement and have enhanced cooperation in multilateral fora. To support the implementation of the Paris Agreement, the EU will seek closer cooperation on climate change mitigation and adaptation and mutual learning to inform the development of the long-term strategies to be submitted under the Agreement.

> **As energy demand grows, India's ties with the international energy system will deepen, as will its stake in global energy security.**

Closer coordination will be needed at the multilateral level to accelerate the global clean energy transition, build sustainable, affordable, reliable and modern energy services, and to find responses to geopolitical challenges generated by this ongoing transition.

The strategy proposes several actions related to clean energy and climate action, including to:

**1.**
Continue the implementation of the EU-India Clean Energy and Climate Partnership through regular exchanges, establishing a climate change dialogue, and use it as a platform to coordinate multilateral and bilateral approaches to climate change and energy security.

**2.**
Support a clean energy transition, through contribution to India's flagship initiatives on offshore wind, solar power, smart grids, energy efficiency, energy access and affordability.

**3.**
Support the development and implementation of climate and energy action at the local level, including in the framework of the Global Covenant of Mayors for Climate and Energy in India.

**4.**
Step-up coordination with India at the multilateral level to strengthen global action on climate change, including the implementation of the Montreal Protocol, on environment and clean energy, supported by enhanced cooperation in international fora on research and innovation.

**5.**
Support the implementation of the Paris Agreement, share knowledge on modelling and the development of low emissions scenarios to inform mid-century low greenhouse gas emission development strategies, as well as on climate change adaptation.

**6.**
Continue to actively support the International Solar Alliance, including through the European Investment Bank.

### Energy Panel

High-level discussions on climate and energy related issues take place between officials from the Government of India and the EU institutions, inter alia, in the Energy Panel. Under the Energy Panel, four Joint Working Groups (JWG) have been established on:

- Energy Security (co-chairs: Ministry of External Affairs/Ministry of Petroleum and Natural Gas, Government of India and Directorate-General for Energy (DG ENER), European Commission);
- Renewable Energy (co-chairs: Ministry of New and Renewable Energy, Government of India and DG ENER, European Commission);
- Energy Efficiency, Smart Grids and Electricity Markets (co-chairs: Ministry of Power, Government of India and DG ENER, European Commission);
- Clean Coal (co-chairs: Ministry of Power and Ministry of Coal, Government of India and DG ENER, European Commission).

### Climate Dialogue

Both the 2016 Joint Declaration between the European Union and India on Clean Energy and Climate Partnership and the 2017 EU-India Joint Statement on Clean Energy and Climate Change refer to the establishment of an India-EU climate change dialogue, to support the dialogue by working groups and events in areas of mutual interest and to further the objectives of the United Nations Climate Change Convention and the Paris Agreement.

### Link with Other Partnerships

In 2016, in addition to the Clean Energy and Climate Partnership, India and the EU also agreed an India-EU Water Partnership, followed with a Memorandum of Understanding in that same year. The (re)use of water, cleaning of water, solar pumping, irrigation, and the need for increased resilience for floods and droughts is of course strongly linked to climate change and the clean energy transition. The same is true for the Joint Declaration of Partnership for Smart and Sustainable Urban Development, which was agreed at the EU-India Summit in October 2017, and for the EU-India Resource Efficiency Initiative launched in 2017, funded by the EU and being implemented together with the Indian Ministry for Environment, Forestry and Climate Change (MoEFCC) and NITI Aayog. Smart and sustainable urban development, for example a cleaner and smarter transport sector, and resource efficiency, moving towards a circular economy, will both be crucial for the needed clean energy transition and for tackling climate change.

### Activities by EU Member States

Many EU Member States have established a strong and close cooperation with India in the area of clean energy and climate action. It is therefore important that the European Union coordinates its activities closely with EU Member States. The Delegation of the European Union to India therefore regularly organises meetings with the Environment, Climate and Energy Counsellors of the Member States, aiming at ensuring synergy and avoiding overlap.

# Projects in the Area of Renewable Energy, Energy Efficiency and Climate Action

**For both the European Union and India, it is important to not only have a dialogue between the administrations, but to also have concrete activities and projects bringing together European and Indian businesses, stakeholders, scientists and civil society and contributing to the energy transition, reduction of GHG emissions and air pollution in India and Europe.**

**EU-India Technical Cooperation Project: Energy**

The "EU-India Technical Cooperation Project: Energy" is operational since September 2014 and will end in September 2020. Under this project the EU is supporting the Ministry of New and Renewable Energy (MNRE) with dedicated experts to contribute to India's sustainable and inclusive development goals by increasing the use of green energy sources, energy efficiency and clean technologies, based on the local experience of both India and the EU.

The aim of the project is to create an enabling environment to support the exchange of best practices, enhance technical and institutional capacities of project beneficiaries through studies, seminars, study tours and awareness raising events.

Under this project, the EU has successfully supported the creation of a Rooftop Cell with the MNRE, strengthening India's technical and institutional capacity in promoting solar roof-top energy, and enhancing awareness amongst public and private actors on the need to switch to renewables.

**At the state level, the EU TA team is actively supporting three states - Punjab, Uttar Pradesh and Maharashtra to help them better understand and integrate Grid Connected Rooftop Solar guidelines Phase II.**

In January 2020, the project supported the design and launch of the first mobile app for a Delhi Power Distribution Company - BSES Rajdhani Power Limited. This is a first-of-its-kind application developed for a utility company in India, which will act as a repository of information for the users on rooftop solar installation and connect them with potential installers. The application will be a one-stop solution for information and associated services on grid-connected solar systems helping consumers make conscious decisions on the installation of rooftop solar system. It also supports India's ambition of 40000 MW solar rooftop installations by 2022.

**Clean Energy Cooperation with India (CECI)**

Clean Energy Cooperation with India (CECI) aims at enhancing India's energy generation capacity with least carbon residual, thereby contributing to the mitigation of global climate change. Project activities will support India's efforts to secure energy supply, within a well-established framework for strategic energy cooperation between the EU and India. The project will facilitate the transfer of knowledge and technological know-how from the EU experience in the sector and its adaptability to the Indian context, also through the involvement of European businesses in the energy technologies sector (renewables, energy efficiency, electrical network equipment) and by fostering their cooperation with Indian actors. The project focuses on:

- Technical assistance and advisory services to the Ministry of New and Renewable Energy (MNRE) and Solar Energy Corporation of India (SECI) for the implementation and management of identified solar parks;
- Technical assistance and advisory services to the Ministry of New and Renewable Energy (MNRE) and National Institute of Wind Energy (NIWE) in the area of offshore wind energy;
- Legal and policy support to the development and implementation of the Energy Conservation Building Code for the commercial building sector in India in collaboration with the Bureau of Energy Efficiency.

**EU-India Clean Energy and Climate Partnership (CECP)**

The project India-EU Clean Energy and Climate Partnership (CECP) started in December 2018. It is financed by the Partnership Instrument (PI) of the European Union and managed by the Delegation of the European Union to India. PricewaterhouseCoopers Private Limited (PwC India) is the implementing partner for this project, together with NIRAS A/S, EUROCHAMBRES and the Council on Energy, Environment and Water (CEEW). The overall objective of the project is to reinforce cooperation between the EU and India on climate change and energy with a view to ensure a secure, clean, affordable and reliable energy supply for all and to progress in the implementation of the Paris Agreement. In these areas, the project should result in further strengthening:

- Policy dialogue between India and the EU and its Member States action; and
- Cooperation (including research and innovation) between India, EU, EU Member States and key stakeholders.

The project will address issues like energy efficiency in buildings (Energy Conservation Building Code, nearly zero energy buildings, smart readiness indicators and cooling) and industry, development and deployment of renewable energy, including solar and offshore wind, smart grid applications, energy storage, energy recovery from waste, increasing access to clean energy, climate mitigation and adaptation initiatives, accountability framework for mitigation, sustainable patterns of consumption and production, sustainable financing of clean energy, energy efficiency and climate action.

**The beneficiaries of the CECP project and the local counterparts are the Ministry of New and Renewable Energy (MNRE), Ministry of Power (MoP) and the Bureau of Energy Efficiency (BEE, a statutory body under the MoP), the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, as well as other national and state agencies in the area of clean energy, energy efficiency and climate change.**

The project started in December 2018 and will end in December 2021.

**India-EU Strategic Partnership for Implementation of the Paris Agreement (SPIPA)**

In 2017, on the margins of the high-level segment of COP23, European Commissioner for Climate Action and Energy, Miguel Arias Cañete, launched new EU strategic partnerships for the implementation of the Paris Agreement. Globally the SPIPA project is being funded jointly by the European Union's Partnership Instrument and by the German Federal Government's International Climate Initiative. The countries under the project include all G20 countries, except the EU Member States, i.e. Argentina, Australia, Brazil, Canada, China, India, Indonesia, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey and the US. In India, the nodal partner ministry is the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India.

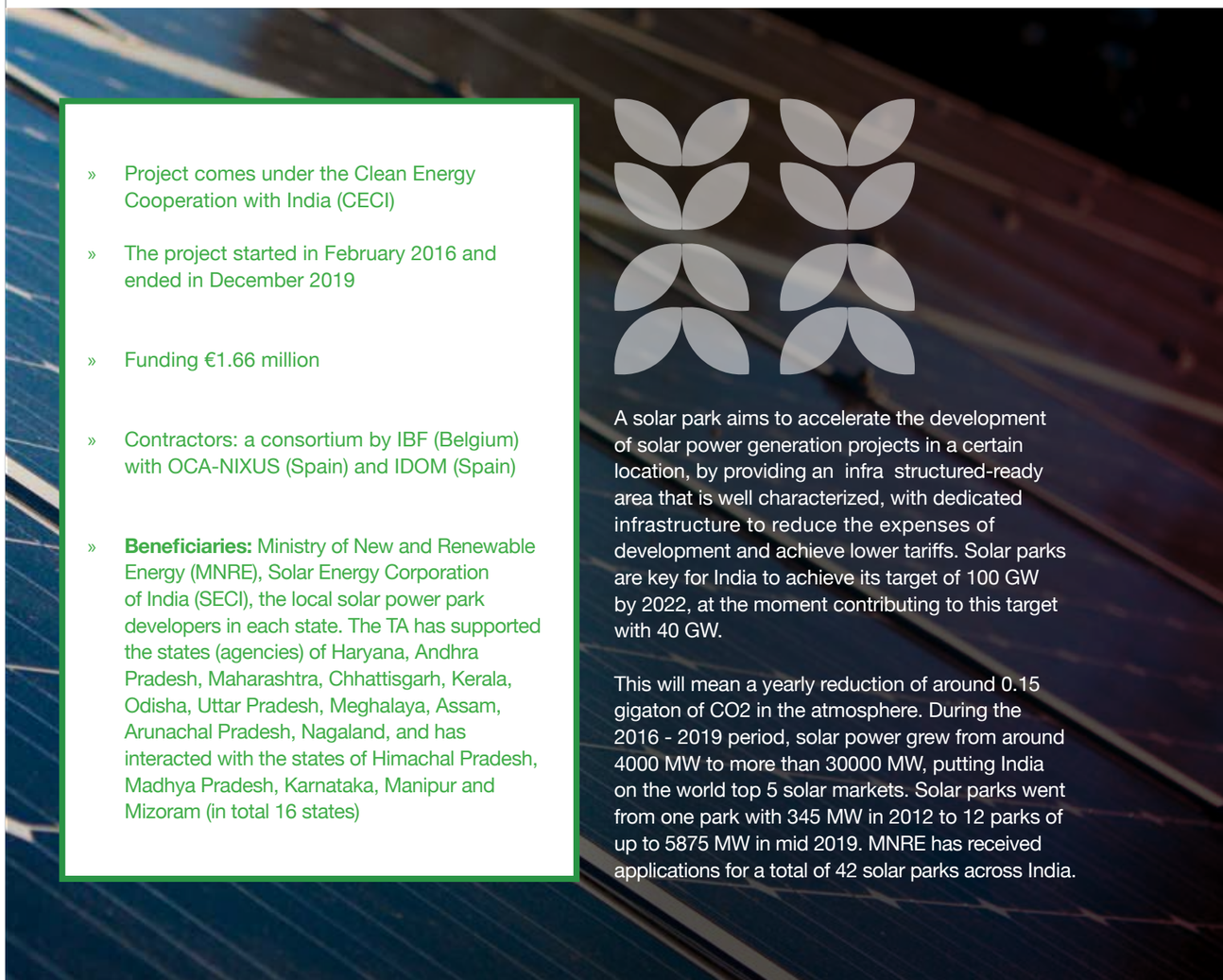
The project is being implemented through the EU Delegation with the support of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. For all countries the total financing is €20 million from the EU's Partnership Instrument and co-financing of €5 million from the German International Climate Initiative. The financing for India would be around €2 million till December 2021.

The objective of the EU's climate policy dialogue with India is to deepen the cooperation on climate - related topics including the reduction of greenhouse gases and enhanced resilience against climate change. It complements the dialogue cooperation on clean energy and provides space for addressing crosscutting aspects such as innovation or the water-energy nexus. Based on the India-EU Climate Partnership interactions, the following activities have been proposed:

- Networking, capacity building and knowledge management;
- Low carbon modelling;
- Technical exchange on monitoring of climate action;
- Sector activities: adaptation;
- Sector activities: mitigation.

# Cooperation in the Area of Solar Energy

## Technical Assistance (TA) for the implementation and management of identified solar parks



- Project comes under the Clean Energy Cooperation with India (CECI)
- The project started in February 2016 and ended in December 2019
- Funding €1.66 million
- Contractors: a consortium by IBF (Belgium) with OCA-NIXUS (Spain) and IDOM (Spain)
- **Beneficiaries:** Ministry of New and Renewable Energy (MNRE), Solar Energy Corporation of India (SECI), the local solar power park developers in each state. The TA has supported the states (agencies) of Haryana, Andhra Pradesh, Maharashtra, Chhattisgarh, Kerala, Odisha, Uttar Pradesh, Meghalaya, Assam, Arunachal Pradesh, Nagaland, and has interacted with the states of Himachal Pradesh, Madhya Pradesh, Karnataka, Manipur and Mizoram (in total 16 states)

A solar park aims to accelerate the development of solar power generation projects in a certain location, by providing an infra structured-ready area that is well characterized, with dedicated infrastructure to reduce the expenses of development and achieve lower tariffs. Solar parks are key for India to achieve its target of 100 GW by 2022, at the moment contributing to this target with 40 GW.

This will mean a yearly reduction of around 0.15 gigaton of CO2 in the atmosphere. During the 2016 - 2019 period, solar power grew from around 4000 MW to more than 30000 MW, putting India on the world top 5 solar markets. Solar parks went from one park with 345 MW in 2012 to 12 parks of up to 5875 MW in mid 2019. MNRE has received applications for a total of 42 solar parks across India.

The project, based on the experience and expertise in solar parks of our team of consultants, has provided a wide range of services to assist solar parks in India since early 2016 up to now, namely:

**1.**
Revision and development of detailed project reports for the approval of selected solar parks by MNRE and SECI across several states in India, including the northeastern part of India;

**2.**
Grid studies to integrate solar parks and intermittent renewable energies in several Indian states;

**3.**
Revision and draft of new renewable energy and solar policies in several states;

**4.**
Draft, consultation and publication of the standard operation procedures for development, implementation, construction, operation and maintenance of solar parks, including an operation and maintenance manual and a health and safety manual for solar parks including recommendations for solar plants based on international best practices;

**5.**
Design and implementation of an online monitoring tool for solar parks available at www.mnre-solarparksindia.com and also as free downloadable apps, including general information on solar parks and news as well as dynamic data on energy, power, voltage and frequency from commissioned solar parks;

**6.**
Direct support to MNRE's created Solar Power Park Developers (SPPD) joint working group and organization of national meetings. Three meetings have been organised till 2019, i.e. in Hyderabad, in Shillong and in Jodhpur;

**7.**
Study tours to Europe to showcase best practices in hybrid cleaning for PV plants, storage applications in national grids, tracking for PV plants, floating solar PV solutions and grid integration of large capacities of intermittent renewable energy sources with a focus on solar.

Several EU companies are actively participating in the solar revolution in India as investors, equipment suppliers, consultants and certification bodies in PV modules and inverters.

# PV Rooftop Solar

- EU-India Technical Cooperation Project
- **Project duration:** September 2014 - September 2020
- **EU Funding:** €2.02 million
- **Implemented by:** Consortium of IDOM Consulting Engineering & Architecture SAU - M Power Energy India (P) Ltd - PE International AG
- **Beneficiaries:** Ministry of New and Renewable Energy
- **Website:** www.pvrooftop.in

Under the EU's technical assistance project to MNRE, the EU facilitated setting up a solar PV roof-top cell within the Ministry to contribute towards India's sustainable and inclusive development objectives and enhance the roof-top solar deployment within the country. The cell started its operations in July 2016 and is assisting MNRE in its constant endeavour to promote and implement the Grid Connected and Small Power Plant Programme in India. The highlights of the activities of the PV Rooftop Cell are as follows:

- **Enhancement of Solar Photovoltaic Installation (SPIN) Portal:** The PV Rooftop Cell supported the MNRE and National Informatics Centre for modification of the Solar Photovoltaic Installation Portal. Solar Photovoltaic Installation portal developed by the National Informatics Centre is a national database of the solar rooftop installations across India. The portal also assists MNRE in management of some of its processes. The portal can be accessed using www.solarrooftop.gov.in.

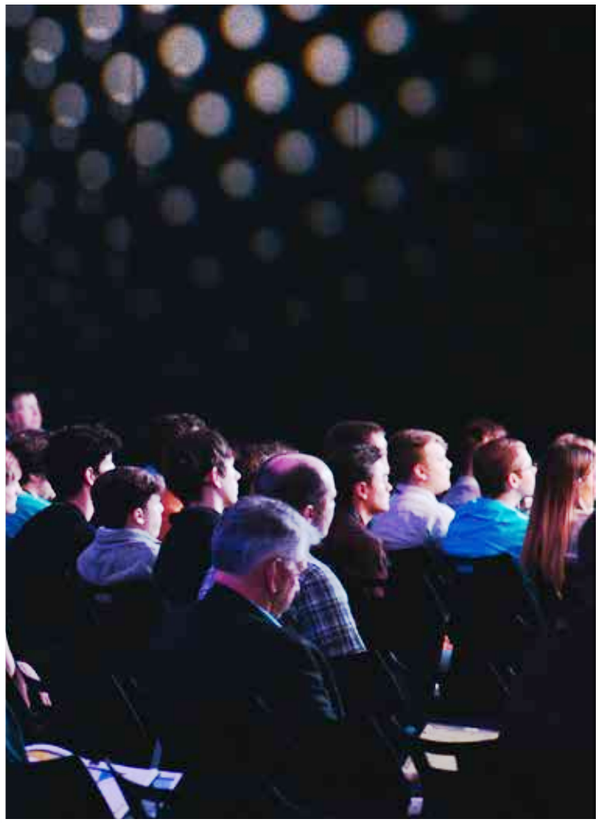
- **Information guide on Grid Connected Rooftop (GCRT) Programme:** To support the GCRT programme, a coherent information guide was developed by the PV Rooftop Cell, aiming to provide information about rooftop solar business models, stakeholders, promotional schemes, and policies and new initiatives in one place to raise awareness amongst the general public.

» **Single Window Clearance Portals:** With an aim to ease and expedite the implementation of Ministry of New and Renewable Energy's Grid Connected Rooftop and Small Solar Power Plants Programme in the country, PV Rooftop Cell developed a "Single Window Clearance Portal". This brings all major state specific stakeholders involved in the grid connected rooftop solar implementation on a single online platform. The portal has been successfully launched for Delhi and Goa. Support to other states, namely Maharashtra, Uttar Pradesh, West Bengal and Punjab is currently underway.

» **Rooftop Solar Knowledge Centre (PVTECH mobile app):** PVTECH is a mobile application in the country, supported by the EU, that provides one-stop comprehensive and updated information on Grid Connected Rooftop Solar PV Systems. It helps to understand the basics, technology, policy and finance aspects related to rooftop solar PV systems. In addition, consumers can submit their interest for installation of rooftop solar system simply through this application. Developed by PV Rooftop Cell, the app will be replicated and adopted based on the state specific requirements promoting grid connected solar rooftop systems across the country.

» **Workshops and Conferences:** The PV Rooftop Cell organizes and participates in various public promotion activities, technical discussions, conferences and stakeholder consultations across the country. Specific technical workshops, conferences and webinars are regularly organized by PV Rooftop Cell.

» **Reports prepared by PV Rooftop Cell:**
- Guidelines to make the rooftops (Reinforced Cement Concrete and Metal Sheet) of the new buildings solar-ready to harness full potential;
- Operation and maintenance contract between owner and contractor for rooftop solar plant installed under CAPEX model;
- Minimum technical standards and code of practice for grid connected rooftop solar installation in India.



# Cooperation with the International Solar Alliance (ISA)

The ISA was launched jointly at COP21 by India and France. It is an international organisation based in India, aiming at:

» Providing a platform for cooperation among solar resource rich countries with an ambition to undertake joint efforts required to reduce the cost of finance and technology;
» Mobilizing more than US $1000 billion of investments needed by 2030 for massive deployment of solar energy, and pave the way for future technologies adapted to the needs;
» Working together towards the deployment of appropriate benchmarks, facilitating resource assessments, supporting R&D and demonstration facilities, encouraging innovative and affordable applications of solar technologies;
» Promoting solar technologies, new business models and investments;
» Facilitating capacity building for promoting solar technologies;
» Formulating projects and programmes;
» Developing an innovative financial mechanism;
» Building a common knowledge e-portal.

**Joint Declaration between the EU and the ISA**

On 11 December 2018, during COP24 in Katowice, Commissioner Miguel Arias Cañete on behalf of the European Union and Director General, Mr Urendra Tripathy, on behalf of the International Solar Alliance, signed a Joint Declaration with the intention to further deepen the cooperation between the EU and the ISA.

The Joint Declaration states that as a Partner Organisation, the EU, represented by the European Commission, will endeavour to be part of the ISA Assembly. This is also reflected in the Joint Communication on the Elements for an EU Strategy on India of 20 November 2018 and the Council Conclusions on that strategy of 10 December 2018.

**ISA logo**

The importance that the European Union attaches to the International Solar Alliance is also very well reflected by the fact that the ISA logo was designed and developed under the EU technical assistance project for the Ministry of New and Renewable Energy. The ISA logo consists of 121 dots. Each dot represents one of the 121 countries who are part of the alliance.

The logo was transferred to the ISA Secretariat at a ceremony in the presence of the then European Union Ambassador Mr. Tomasz Kozlowski, the Director General of the International Solar Alliance, Mr. Upendra Tripathy and the Secretary of the Ministry of New and Renewable Energy, Mr. Anand Kumar.

INTERNATIONAL SOLAR ALLIANCE

**Infopedia**

- Project under the Clean Energy Cooperation with India
- The project started in April 2018 and will end in April 2020
- Funding: €299,995
- Implemented by: COWI BELGIUM SPRL and Exergia
- Beneficiaries: International Solar Alliance
- Website: isainfopedia.org

The EU funded the setting up of an online knowledge-sharing platform/repository called “Infopedia” for ISA, which aims to promote access to solar power in a regional and sub-regional context among the ISA member countries. It contains:

- **Country counters:** A dedicated space on the online platform for each Member Country to present their solar energy profile;
- **A solar information hub:** Aggregating solar projects in a central database for best practice sharing among member countries;
- **A solar academy:** A full-fledged learning management system allowing ISA and its partners to create and host courses on solar technology;
- **ISA communication tools:** Tools and methodologies to facilitate communication among member countries;
- **A solar directory:** A self-registration directory for the solar industry, NGOs, research centres and financing institutions.

**European Investment Bank (EIB)**

The EU is also supporting ISA through the European Investment Bank, which is the largest climate financier in the world. In March 2018, EIB, the EU Bank announced its partnership with the International Solar Alliance to support the expansion of solar energy in India and beyond. India was the leading recipient of EIB financing for solar investment outside the European Union, both in 2017 and overall since 2013. The EIB has approved a total of €640 million of new investment in solar projects in India, set to provide clean energy to an estimated 4.2 million households and save more than 4 million tons of $CO_2$ emissions.

# Cooperation in the Area of Wind Energy

For over 20 years, onshore wind energy has been playing an important role in India with over 32 GW of installed capacity throughout the country, making India the fourth largest installed wind power capacity in the world. The Government of India determined that 175 GW of renewable energy capacity will be installed by 2022, of which 100 GW will be from solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydropower.

**The cooperation between the European Union and India in the area of wind energy focuses very much on off shore wind. The European Union currently has an installed capacity of approximately 20 GW, making it the biggest offshore wind market in the world.**

Offshore wind is a local clean source of electricity that supports national energy security (i.e. reducing import of fossil fuels) while contributing to reducing climate change and air pollution. It has a smoother generation profile, higher wind resource and production predictability than onshore wind. It avoids onshore land concession and right of way issues, especially in view of large scale projects needed in India, but entails maritime planning considerations. It allows for large scalable/modular power plants with potential for cost competitiveness against other energy generation sources. It further ensures local job creation and growth through the development of a local supply chain, ports and general infrastructure.

India has the potential to become a leading technology exporter and a knowledge hub for the South East Asian region for offshore wind energy with its enormous coastline (~7600 km) and an estimated offshore wind potential of 65 GW. While it is expected that the starting price for offshore wind in India will be lower than the initial costs but higher than the prevailing costs in Europe, it is reasonable to anticipate India's potential for realizing a very steep cost decreasing trajectory.

**In the area of offshore wind energy, the cooperation between the EU and India is inter alia shaped through two EU funded projects, Facilitating Offshore Wind in India (FOWIND) and the First Offshore Wind Project of India (FOWPI).**

Whereas FOWIND focused on the identification of potential zones for development through baseline technical commercial analysis and preliminary resource assessment in the states of Gujarat and Tamil Nadu, FOWPI addressed the next step with the provision of providing technical assistance in the implementation of the first offshore wind farm project of India.

**Facilitating Offshore Wind in India (FOWIND)**

- The project **started** in December 2013 and ended in March 2018
- **EU funding:** €4 million
- **Implemented by:** Global Wind Energy Council ASBL, Belgium, Garrad Hassan India Private Limited (trading as DNV GL), Center for Study of Science, Technology & Policy (CSTEP), Gujarat Power Corporation Limited (GPCL), World Institute of Sustainable Energy (WISE)
- **Beneficiaries:** Ministry of New and Renewable Energy and National Institute on Wind Energy
- **Website:** www.fowind.in

**First Offshore Wind Project of India (FOWPI)**

- Project under **Clean Energy Cooperation with India** (CECI)
- **Timeline:** January 2016 - July 2019
- **EU funding:** €3 million
- **Implemented** by: COWI
- **Beneficiaries:** Ministry of New and Renewable Energy (MNRE) and National Institute on Wind Energy (NIWE)
- **Website:** www.fowpi.in

FOWPI's scope included capacity building of local institutions, facilitation of technical dialogue and advisory for the first offshore wind farm of India, including offshore measurement campaign, wind turbine foundation, electrical networks, geophysical works, coastal assessment, permits and procedures, environmental screening and scoping, financial modelling and others.

FOWIND and FOWPI activities supported the Ministry of New and Renewable Energy (MNRE) in its offshore wind energy targets of 5 GW by 2022 and 30 GW by 2030 and the first offshore wind project in India, of 1 GW, which has evoked a keen response from both the EU and Indian industry after the release of the Expression of Interest document published by the National Institute of Wind Energy (NIWE) – the nodal agency for offshore wind energy in India.

The following India offshore wind reports are publicly available:

**FOWPI.in website:**

- Metocean Data Requirements
- Metocean Study Report
- Weather Windows for Installations
- Foundation Design Report
- Wind Turbine Layout and AEP Report
- Procedures for Offshore Wind
- Coastal Aspects and Port Requirements
- Environmental Scoping Report and Consent Register
- Recommendations on EIA Framework and Consenting Process
- Comparison between LiDAR and Vortex Data

**FOWIND.in website:**

- Offshore Wind Development in India: Report on Supply Chain, Ports and Logistics
- Pre-feasibility Report for Offshore Wind Power Development in Tamil Nadu
- Pre-feasibility Report for Offshore Wind Power Development in Gujarat

**GWEC.NET website:**

Feasibility Study for Offshore Wind Farm in Tamil Nadu

- Feasibility Study for Offshore Wind Farm in Gujarat
- From Zero to Five GW: Offshore Wind Outlook for Gujarat and Tamil Nadu (2018-2032)
- Grid Integration Study for Offshore Wind Farm Development in Gujarat and Tamil Nadu

The NIWE website also contains links to the FOWPI and FOWIND websites.



# Cooperation in the Area of Energy Efficiency

## ACE: E2 – Adoption, Compliance, Enforcement for Energy Efficiency in Buildings

- Project under **Clean Energy Cooperation with India (CECI)**
- The project started in January 2016 and ended in October 2019
- **EU funding:** €1.3 million
- **Implemented by:** EXERGIA S.A., member of SACO Consortium, in collaboration with PwC India
- **Beneficiaries:** Ministry of Power, Bureau of Energy Efficiency (BEE), states of Odisha, Maharashtra, Bihar and Madhya Pradesh
- **Website:** www.ace-e2.eu

**India has been witnessing a tremendous growth in the building and construction sector in the last five years. India is likely to add around 700-900 million square meter area (commercial and residential) by 2030.**

Out of the current total electricity consumption, around 24% is consumed in the residential and 9% in the commercial building sector. The sector puts an enormous pressure on the demand for energy, water and construction materials, etc.

The aim of the project was to support the implementation of the nationally developed Energy Conservation Building Code (ECBC) for commercial buildings and to improve efficiencies in upcoming new buildings. Four Indian states, namely Bihar, Maharashtra, Madhya Pradesh and Odisha were selected to provide this support.

The project aimed at further increasing the required local involvement and commitment of state-designated agencies, urban local bodies, distribution companies (DISCOMS) and works departments in these states. The project also targeted enhancing knowledge exchange between all Indian states through the Common Implementation Forum.

The ECBC was launched by the Ministry of Power, Government of India in May 2007, as the first step towards promoting energy efficiency in the building sector.

The revised version of the code was launched in March 2017. It is expected that the implementation of the code will significantly reduce the energy demand in commercial buildings.

**Impact of the project:**

- ECBC notification at final stage in all states;
- Trained 3200 professionals including government officials;
- Demonstrated ECBC compliance for approximately 0.364 million sqft area of buildings;
- Improved engagement of stakeholders in ECBC implementation;
- Created common implementation forum for energy efficiency by engaging all states.

**Way forward:**

- The India-EU Clean Energy and Climate Partnership will continue addressing energy efficiency of buildings, including:
- Nearly Zero Energy Buildings
- Smart Readiness Indicators - Common implementation forum to discuss long term opportunities in the building sector.

**Activities of the ACE-E2 project include:**

**1.** Setting up ECBC cells (team of experts) in states at respective state designated agencies;

**2.** Providing a situation analysis for each state to understand technical and administrative readiness;

**3.** Integration of ECBC guidelines in the state by-laws;

**4.** Undertaking next level of consultations in order to finalize different mechanism and then demonstrate the same by assisting the state;

**5.** Organising capacity-building programs for professionals (architects, design consultants, government officials, students) to design, evaluate and monitor ECBC complaint buildings;

**6.** Revision of the applicable schedule of rates for the ECBC complaint materials;

**7.** Organising regional and national level (including all states and Union Territories) workshops to create a common forum for the implementation of ECBC in states of India;

**8.** Organising webinars on various relevant topics to create awareness and expertise.

# EU-India Cooperation on Clean Energy and Energy Efficiency in Eco-Cities

- The project **started** in January 2015 and is expected to be completed by September 2020
- **EU funding**: €9 million. The project is co-funded by the International Finance Cooperation (IFC): €3 million
- **Beneficiaries**: The program is structured around five cities - Bengaluru, Bhubaneswar, Chennai, and the Mumbai and Pune metropolitan regions
- **Website**: www.ecocities.in

India's rapid urbanization is placing a huge demand on infrastructure and critical municipal services for its cities and citizens. This has led to a growing gap in reliable energy and water supplies, increasing traffic congestion and air pollution, open dumping, and lack of affordable housing especially for the urban poor. In response to these needs, the Eco-Cities Program is developing climate smart interventions in targeted urban sectors and facilitating private-sector financing via public-private partnerships and direct investments. The program is building capacity of government officials, raising awareness, and sharing best EU practices.

**The program is on track to facilitate over $600 million in private-sector financing and avoid about 850,000 tonnes of greenhouse gas emissions annually while providing improved access to services to over two million people by the end of 2020.**

Although projects are primarily structured around Bhubaneswar, Bengaluru, Chennai, Mumbai Metropolitan Region, and Pune Metropolitan Region, the broader urban solutions developed are scalable and being replicated across the country, further leveraging developmental impacts for the EU and India.

This energy and climate change technical advisory program is focusing on conventional clean energy sectors (e.g., scale up of solar energy to support India meet its targets) and nascent energy areas (e.g., adoption of electric vehicles to displace fossil fuels). The International Finance Corporation team is implementing several first of its kind, scalable urban-sector interventions for India via:

- Analytical tools and diagnostics (e.g. climate-action planning for cities using World Bank's CURB tool);
- New public private partnership (PPP) implementation models (e.g. rooftop solar based on net or gross metering; hybrid annuity);
- New operating models (e.g., procurement of e-buses by cities using gross-cost PPP model); and
- Innovative technologies (e.g. use of district energy for meeting increasing cooling demand in cities).

**Ongoing and completed projects under the Eco-Cities program will increase energy efficiency while enabling its longer-term transition to clean energy.**

The greenhouse gas emissions expected to be avoided by these projects will collectively support the country's progress towards meeting its Nationally Determined Contributions (NDC) under the Paris Agreement while also addressing key Sustainable Development Goals. By supporting sustainable development for a large emerging economy like India, the EU is establishing its continuing leadership in addressing the global climate-change challenge.

The Eco-Cities program is providing a practical platform for sharing EU best practices with municipalities and other stakeholders, inter alia by providing opportunities for EU companies to engage via business-development trade missions, technical program events, and study tours enabled by the program and participate in city infrastructure projects as appropriate.

# Integration of Renewable Energy in the Grid – Smart Grids

With ambitious targets of 175 GW of renewable energy in India by 2022, it is a pre-requisite to have smart and efficient networks to optimally utilise the renewable energy installed capacity. The importance of EU-India cooperation on Smart Grid has been underlined in the 2016 Clean Energy and Climate Partnership. EU-India Smart Grid workshops have been held in Nice (June 2015), Vienna (November 2015), Bornholm, Denmark (September 2016), New Delhi (March 2017, 2018 and 2019), Florence (November 2018) and Paris (November 2019), involving Indian and European policy makers, network operators, regulators and technology providers in interactions on the following themes:

» European and Indian demonstration projects on energy storage to promote the integration of Renewable Energy and Electric Vehicle;
» Evolving role of distribution system operators in the context of smart grids;
» Upscaling and transferring promising demonstrations in Indian and European contexts;
» Regulatory Frameworks enabling smart grid applications.

**Next to the workshops, joint EU-India smart grid demonstration projects are co-financed through the Horizon 2020 programme (one topic open to India in the 2018 work programme; a new topic, for co-funding, will be included in the 2020 work programme). In addition an EU-India smart grid replication study will be carried out.**

A first EU-India Electricity Market Design and Regulation workshop was held in Florence in November 2018, with a focus on regulatory frameworks to enable large-scale integration of renewable electricity. A second EU-India workshop on Power Market Design was organised during the India Smart Utilities Week in March 2019 in Delhi.

# Global Covenant of Mayors

The International Urban Cooperation (IUC) programme aims to enable cities in different global regions to link up and share solutions to common problems. It is part of a long-term strategy by the European Union to foster sustainable urban development, in line with international initiatives, including the UN Urban Agenda, Sustainable Development Goals, and the Paris Agreement.

**General info**

» The IUC programme **started** in 2016 and is expected to be completed by 2020
» **EU funding**: €2.8 million
» **Websites:**
• www.iuc.eu
• www.globalcovenantofmayors.org;
• www.covenantofmayors-southasia.org

The IUC programme supports the building process of the Global Covenant of Mayors for Climate and Energy in India.

**The Global Covenant of Mayors for Climate & Energy (GCoM) is an international coalition of local and regional authorities with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low-carbon society, based on the fact that local governments are key contributors to the overall greenhouse gas emissions and therefore an important part of the solution.**

GCoM aims to:

**1.**
Create the largest coalition of cities and local governments supported by global and local city networks;

**2.**
Reduce GHG emissions, fostering local climate resilience and access to energy;

**3.**
Recognise that ‘climate action’ is about improving quality of life, creating new jobs and economic opportunities;

**4.**
Enforce vertical alignment and collaboration across all levels;

**5.**
Establish an ‘evidence base’ for increased investment in urban low carbon infrastructure.

GCoM serves cities and local governments by mobilizing and supporting ambitious, measurable, planned climate and energy action in their communities, by working with city/regional networks, national governments and other partners to achieve the initiative's vision.

Local governments joining the GCoM initiative commit to establishing ambitious targets to reduce GHG emissions and increase resilience of their communities by adapting to climate change. This commitment is tracked through the submission of a Climate Action Plan within three years following the formal signing, including the mainstreaming of adaptation considerations into relevant policies, strategies and plans. Signatories commit to report progress in the actual implementation of these strategies every two years.

Almost 10,000 cities from more than 120 countries are GCoM members, representing 10.3% of the global population.

**As of September 2019 fifteen Indian cities in total representing over 25 million people are GCoM members, i.e. Ahmedabad, Bhavnagar, Gandhinagar, Gangtok, Gwalior, Jamnagar, Junagadh, Kochi, Nagpur, Panaji, Patna, Rajkot, Shimla, Surat and Vadodara, signed the commitment.**

It has been calculated that by reaching their own targets, in 2030 GCoM cities will collectively reduce 1,4 billion tons of CO2 per year. GCoM provides the following initiatives to all member cities:

- **Data4Cities:** Development of new reporting standards, city databases and websites to open up access to data for cities to support climate action planning;
- **Innovate4Cities:** Research and innovation agenda to catalyse the scientific advances necessary to better equip cities with the intelligence and tools to take even more ambitious climate action;
- **Invest4Cities:** Invest4Cities call to raise $800 million for technical assistance and credit enhancement financing, and pilot vertically integrated NDC investment plans for two countries.

Through the IUC programme, in 2019/20 the EU will support:

- The GCoM development process in India through the GCoM Coordination Group (bringing together all the GCoM partners to develop the strategy and activities in the country), and the GCoM Helpdesk (managed by ICLEI), a front-line service to support cities in their membership process;
- Implementation of targeted initiatives for capacity building on Climate Action Planning with Indian states and cities;
- Development of four Climate Action Plans according to the GCoM Common Reporting Framework in four cities: Surat, Panaji, Gangtok and Kochi.

# Research

In the area of research and innovation, the EU cooperates with India through its framework programme for research and innovation called Horizon 2020 (2014-2020), which is open to participation of all entities from the world.
As far as collaborative research is concerned, Indian participation is not automatically funded. Participants have to find financial resources for their participation. These could be own funds or funds from the Government of India, foundations and other organisations funding international research and innovation activities. Contributions can also be made in kind. In exceptional circumstances, funding can be received, if the participation is essential for the execution of the project.

All international energy research is an important part of Horizon 2020. To achieve its climate objectives, Europe will have to make the shift to renewable energy to ensure energy security and energy efficiency. All energy research in Horizon 2020 is in line with the commitment the EU has taken in the framework of Mission Innovation.

**Mission Innovation**

Mission Innovation is a global initiative of 24 countries and the European Commission (on behalf of the European Union) working to reinvigorate and accelerate global clean energy innovation with the objective to make clean energy widely affordable. Mission Innovation was announced at COP21 in November 2015, as world leaders came together in Paris to commit to ambitious efforts to combat climate change.

> **The goal is to accelerate clean energy innovation, which is essential to limiting the rise in global temperatures. The global community has made remarkable progress in driving down the costs and increasing the use of key clean energy options. However, these impressive gains are still insufficient to meet the long-term climate goals while providing affordable, reliable and secure energy supplies.**

As part of the launch statement, members committed to:

- Seek to double their governmental and/or state-directed clean energy research, development and demonstration (RD&D) investments over five years;
- Work closely with the private sector as it increases its investment in earlier-stage clean energy companies that emerge from government programs;
- Build and improve technology innovation roadmaps and other tools to help in our innovation efforts, to understand where RD&D is already happening, and to identify gaps and opportunities for new kinds of innovation;
- Provide, on an annual basis, transparent, easily accessible information on their respective clean energy RD&D efforts.

As founding member, India committed to double its governmental clean energy research, development and demonstration investments from about €63 million in 2015 to €130 million in 2020. India co-leads three Mission Innovation challenges, i.e. on (1) Smart Grids, (2) Off-grid Access to Electricity and (3) Sustainable Biofuels, in which the European Commission is active.

Indian experts also participate in the two Innovation Challenges co-led by the European Commission (Converting Solar Light into Storable Fuels and Affordable Heating and Cooling of Buildings). In particular, India has proposed to work and lead research and innovation activities in the area of ‘Physiological Studies for Thermal Comfort’ within the Innovation Challenge on Affordable Heating and Cooling of Buildings, which is an important research topic in the Indian subcontinent.

India is also organising calls under its research programme, which is open to Mission Innovation country members. Under Horizon 2020 all calls on energy research in support of the R&I gap analyses made under Mission Innovation are open to participation of Indian entities. India has in particular expressed interest in calls aiming at strengthening the energy storage capacity and integrating local energy communities with the central grids.

A good illustration of the excellent cooperation between the EU and India in the area of smart grids is the Horizon 2020 project iElectrix and cooperation agreement signed on 15 March 2019, which sets up a 1MW demonstration plant in Delhi. The consortium includes 15 European partners from nine European Union member states and Tata Power from the Indian side. The project is co-funded under EU Horizon2020 to an extent of €8 million.

# European Investment Bank (EIB)

The European Investment Bank, as the bank of the European Union, invests in clean energy, sustainable development and climate related projects, both inside the EU and outside, including India. The EIB derives its funding almost entirely from international capital markets and catalyses further private sector investment by innovating and sharing risk, co-financing, where appropriate with the private sector on climate-action and SDG related projects throughout South Asia.

As an example, the Global Energy Efficiency and Renewable Energy Fund (GEEREF) is managed by the EIB to operate as a 'layered-risk' fund of funds. It invests in the kinds of projects that medium-sized pension funds tend to shun: hydroelectric projects in the Philippines, Indian solar power, or geothermal plants in Ethiopia. GEEREF has a €112 million investment from Norway, Germany, the EU and EIB's own funds, which it uses to partially offset the risk to private investors by assigning first losses to the public money and a preferential return to the private money. The fund raised a further €110 million from private investors on the back of the de-risking strategy to catalyse climate action in developing countries.

> **For more than 25 years now, the EIB has supported long-term investment across India. Following commitments made at the EU-India Summit in 2016, the EIB opened its Regional Representation for South Asia in New Delhi on 31 March 2017, hosted within the offices of the Delegation of the European Union.**

At present, the EIB has approved €3.4 billion for India, mobilizing approximately €10.2 billion of investment in India's infrastructure, energy and climate change projects. Through this portfolio, the EIB finances wind, solar and public transport projects.

> **Most recently, the EIB signed an agreement with the Government of India for a loan of €500 million for the Bengaluru metro project cutting journey time in most cases from two hours by car to 15 minutes in air-conditioned carriages.**

Earlier, the EIB signed and disbursed €450 million for the construction of a 23km long new metro line in Lucknow, and the related purchase of 80 metro cars.

In January 2020, the EIB announced an investment of €600 million in the Pune metro to support the construction of two metro lines comprising some 31km of track and 30 commuter stations.

This followed a €200 million loan to Yes Bank to support investments in solar power by major Indian corporates.

Highlights over the past two years include some €640 million of investment in Indian solar, supporting the construction 1.6 GW of renewable energy and providing more than 4 million households with clean, affordable energy, saving an estimated four million tonnes of $CO_2$. In 2018, the EIB, as the largest lender for renewables worldwide, signed an MoU with the International Solar Alliance, committing to provide low cost, blended (risk sharing) financing, crowding of private sector finance, technical expertise and technology transfer to solar projects in those countries of common engagement.

Given the EIB's role in the development of offshore wind in the EU since the very first projects, the EIB is already working closely with Indian and international stakeholders to examine options for shaping the investment required to kick-start a sector which is potentially strategic both regionally and increasingly globally.

**LIST OF USEFUL WEBSITES**

**Delegation of the European Union to India**
http://eeas.europa.eu/delegations/india_en

**European Commission**
http://ec.europa.eu

**Energy Union and Climate**
http://ec.europa.eu/commission/priorities/energy-union-and-climate_en

**European Investment Bank**
http://www.eib.org

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