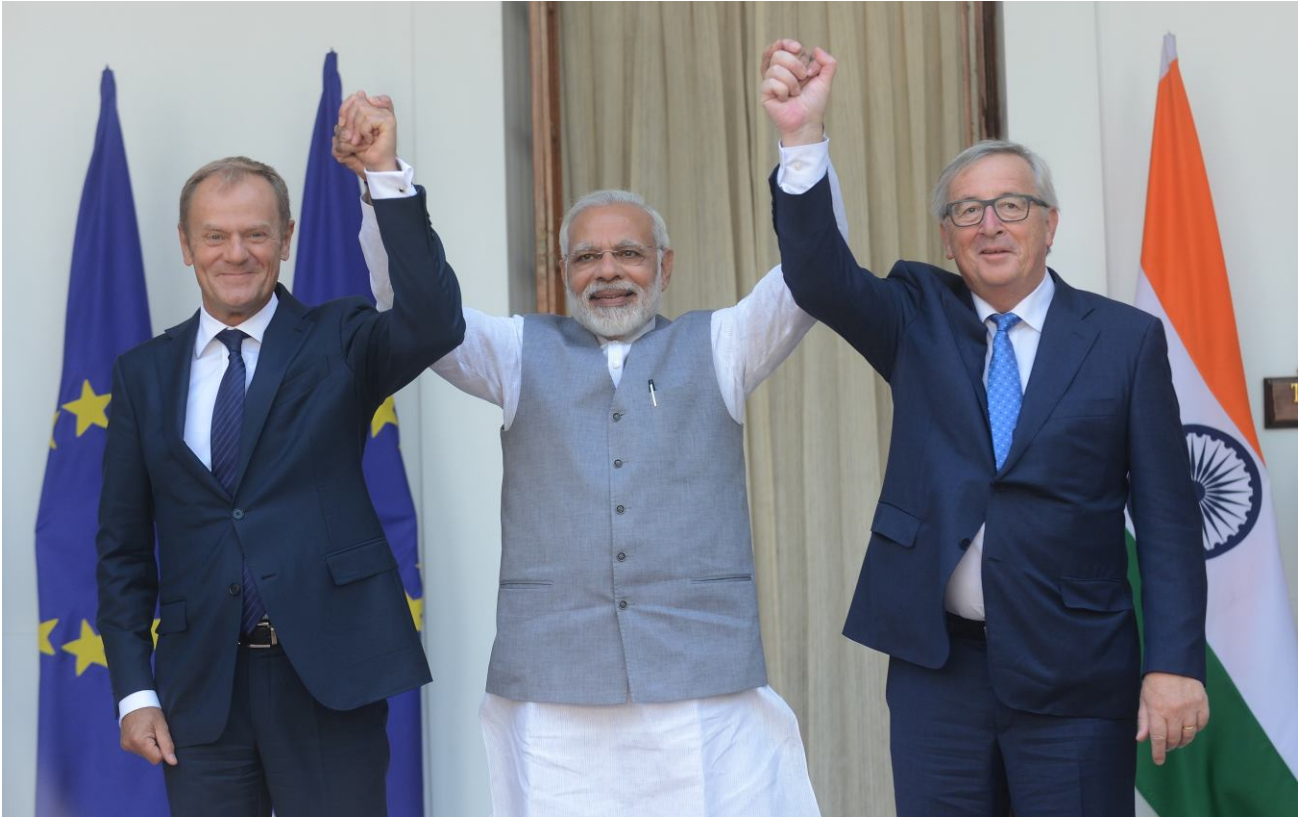


INDIA-EUROPEAN UNION PARTNERSHIPS FOR **SUSTAINABILITY, CLEAN ENERGY & CLIMATE ACTION**



The European Union and India have recognised the importance of clean energy, sustainable development and climate-related initiatives for several years. Most recently, at the EU-India Summit in Brussels on March 30, 2016, European Commission President Jean-Claude Juncker, European Council President Donald Tusk and Indian Prime Minister Narendra Modi reinforced cooperation in these fields with a series of dynamic measures. Progress was reviewed during the visit to India in April 2017 of the EU's High Representative for Foreign Affairs and Security Policy Mrs. Federica Mogherini.



WATER

With 2.45% of the earth's land area, India has 17.5% of the world's total population. Rainfall, though abundant, is concentrated in a few weeks and leads to large run-offs. There is growing reliance on groundwater (65% for irrigation and 85% for drinking water), leading to falling water tables and increased competition between users. With less than 40% of wastewater in towns connected to a municipal sewage system, water pollution is leading to increasing illnesses and declining environmental quality.

An India- European Union Water Partnership was agreed at the 2016 Summit and followed up with a Memorandum of Understanding which was signed in October 2016 in New Delhi by EU Commissioner for Environment, Karmenu Vella and India's Minister for Water Resources, River Development & Ganga Rejuvenation, Uma Bharti. The Partnership foresees cooperation in water law and governance; promotion of research, innovation and exchange of business solutions, and joint initiatives to rejuvenate the iconic Ganga river and India's other water bodies by bringing together a wide community of stakeholders on both sides.



Minister Uma Bharti and EU Commissioner for Environment Karmenu Vella

Implementation of the India – EU Water Partnership is well under way with the organisation of technical exchanges & workshops, annual water fora and the creation of business and networking opportunities.

The specific topics covered range from river basin management planning and governance, through water allocation, water economics and ecological flows in river basin management. Capacity building sessions and technical exchanges on river basin management planning have been organised for the Krishna, Godavari and Mahanadi basins.



Water scarcity is a fact of life

For the next phase of the India-EU Water Partnership some of the agreed priorities are:

sustainable development of river basins; river restoration; ecological flows; water use in irrigation; sustainable and optimal groundwater use and recharge; capacity building and organizational development; the setting up of water accounts; and visualising monitoring data for the Ganga River and for Smart Cities, with a view of prioritising investments better.

Research, Development and Innovation are needed to overcome complex and new challenges. Around twenty four research, development and innovation projects have already been carried out between the EU and India in the last ten years.

The **European Innovation Partnership on Water** (EIP Water) leverages the role of researchers and companies, facilitating innovation and supporting the creation of market opportunities, another key component for the development of the water sector in Europe and India. The EIP Water Online Marketplace offers innovative approaches, projects, products & services, is open to Indian entities at no cost and allows access to almost 300 demonstration sites in Europe <http://www.eip-water.eu>

A joint India-EU call for research and innovation in the water field was launched on 7 November 2017.



Vltava river in Prague

Sustainable and integrated water resource management in India:

From 2007 to 2015, the EU provided € 70 mn. (INR 5 bn. approx.) in development assistance through

European Water Framework Directive (WFD) improving water management. Europe has achieved considerable success in managing its waters based on the Water Framework Directive (WFD). Adopted in the year 2000, the Directive bases the management of water according to river basins, 40 of them international, rather than on administrative or political divisions. EU Member States prepare River Basin Management Plans with the objective of reaching good chemical and ecological status – stringently defined by common standards – before a given deadline. This method has been very successful in improving water quality in the last 15 years. In order to address the challenges in a cooperative and coordinated way, the Member States, Norway and the European Commission have agreed on a Common Implementation Strategy (CIS) for the Water Framework Directive. This has helped to implement the directive, creating *new implementation tools, and proposing solutions* based on previous experience. This model is being shared with Indian stakeholders.

the Rajasthan State Partnership Programme (SPP). The Programme focused on state-wide water sector reforms leading to sustainable and integrated water resource management (IWRM) in eleven districts. Panchayat-based action plans were prepared for 3200 villages in 82 blocks; communities and panchayats have strengthened capacities to manage equitable access to safe and sustainable water and conserve and replenish ground water supply. Important legislation regarding water policy on IWRM in 2010 and a Water Regulatory Act in 2013 have been introduced in Rajasthan as a result of the SPP. The Government of Rajasthan has incorporated principles of IWRM in its water self-sufficiency movement (*Jal Swavlamban Abhiyan*) across the state and in regulation through the enactment of the Rajasthan River Basin and Water Resources Regulatory Act.



CLEAN ENERGY AND CLIMATE CHANGE



India's growing population and industrialisation requires the development of energy supply and the efficient management of energy demand. Moreover, coal-based power plants, presently supplying the bulk of India's electricity, greatly contribute to increased green-house gases and pollution levels. To address these challenges on the supply side, India now has a massive solar power programme which aims to increase the share of renewables from 7% in 2012 to 22% or 100,000 MW in 2022 as well as numerous programmes to promote other renewable energy sources and energy efficiency .



Offshore wind energy has potential in India

During the EU-India Summit in 2016 an **India- European Union Clean Energy and Climate Partnership** was announced with the aim of reinforcing cooperation on implementation of the Paris Agreement by strengthening joint activities for deployment of climate friendly energy sources, including solar energy. The EU supports a wide range of initiatives to enhance India's capacity to deploy low carbon energy production and improve energy efficiency, thereby contributing to the mitigation of global climate change.

The EU strongly supports India's **off-shore wind development**: the FOWIND (Facilitating Offshore Wind in India) project (€ 4 mn.) has carried out resource mapping, policy guidance and capacity building measures; uses EU off-shore lessons learnt to promote the reduction of technical barriers and financial risks; and undertakes techno-commercial studies. This project is being followed up by FOWPI, the First Offshore Windfarm Project in India (€1.8 mn.) to develop designs and technical studies for a 200 MW offshore windfarm off the coast of Gujarat in order to prepare it for bidding.

The EU supports, in cooperation with the Bureau of Energy efficiency, the States of Maharashtra, Madhya Pradesh, Bihar and Odisha with the **implementation of the codes for energy efficiency in commercial buildings** (€ 1.4 mn.). The project is providing technical assistance to set up the legislation and procedures for implementation of the ECBC scheme in those states, as well as developing a certification mechanism and a monitoring and verification framework. It will also support BEE in setting up an ECBC cell forum and includes the review of 2 new or existing buildings in every State, to ensure its compliance with the ECBC codes.

India's Solar Park Programme receives EU assistance to enable integration of solar energy into the electricity grid in a designated green energy corridor. This project of technical cooperation (€ 1.66 mn.) aims at enhancing India's capacity to deploy low carbon energy production, thereby contributing to the mitigation of global climate change. Concretely, the project is developing, in cooperation with the Ministry of New and Renewable Energy and the National Institute for Solar Energy (NISE), a



Indian team at solar park in Spain

set of operations and maintenance manuals for solar parks, a tool to monitor and forecast solar park production as well as technical assistance and capacity building to enhance the planning, development and operation of solar parks throughout India.

The EU has established a **Roof-Top solar cell in the Ministry of New and Renewable Energy** (€ 1 mn. ca INR 70 mn.), assisting in the roll out of India's roof-top solar programme, by promoting the exchange of best practices implementing policies as well as implementing and enforcing existing regulations and developing scalable models for wider dissemination.

EU-India Smart Grid cooperation is being developed with workshops organised with members of the Indian Smart Grid Forum in Nice, Vienna (2015) and in Bornholm Denmark (September 2016). Most recently, the third edition of India Smart Grid Week (ISGW), supported by the EU, took place from 7th to 10th March 2017. As a partner of the event, the European Union and the India Smart Grid Forum co-organized an EU – India workshop to discuss exchange of best practices in the roll out of smart meters and business models for Distribution System Operators/ Utilities in the smart grid era.

A 3 MW Solar Thermal-Biomass hybrid power plant in Bihar is being set up with EU grant assistance of € 8 mn. (SCOPE-BIG).

The EU has offered support for the development of a digital platform for the **International Solar Alliance** spearheaded by India and signed on 30 November 2015 in Paris. Among planned activities is the support of India's Solar Mission through technical studies necessary for the deployment of large scale solar parks, with focus on their grid integration as well as by support to the ISA Secretariat.

The **EU-India Climate Change Dialogue and Partnership** aims to facilitate and foster cooperation in addressing the climate-change-related challenges that India faces.

Speaker Events have been organized – including as a COP22 Side Event at the EU Pavilion in Marrakech, Morocco - involving bilateral organisations, academicians, practitioners, researchers, and representatives from private companies to discuss how best to integrate experiences with technology and policy innovation in India and the EU to support the implementation of the NDCs.

A conference on the **“Implementing the Kigali Amendment to Montreal Protocol in India”** took place on 27th April, 2017. The aim of the Green Cooling conference was to discuss sustainable solutions for the rapidly growing air-conditioning and cold-chain sector in India through an EU-India dialogue on successful policy, technical and financial solutions to help tackle the use of HFCs (hydroflourocarbons) in the Indian cold chain sector.

URBANISATION

It is estimated that by the year 2050, the number of people living in Indian cities will touch 843 million. Globally, it is expected that 60% of the world's people will be living in towns and cities in the next 10 years, creating opportunities for the efficient provision of services of energy, transport, waste management, health and education. At the same time, there are challenges of rural to urban migration (10 million per year in India) and overcrowding, pollution, and inadequate supply of these very same services on account of costs, prices, technical constraints and administrative issues. India's government has taken up the challenge by launching the 100 Smart Cities Mission and the AMRUT programmes. These will develop public transport, sewerage, water supply and public green spaces.

The European Union has responded to India's urbanisation challenge with a number of initiatives:

At the India-EU Summit in October 2017, the two sides agreed on a Joint Declaration on Partnership for Smart and Sustainable Urban Development which will contribute to Indian flagship programmes such as Swachh Bharat, the 100 Smart Cities Mission and AMRUT. A Work Plan to address the challenges of governance and regulation, infrastructure funding, sustainable transport, resource efficiency and waste management, and air quality will be finalised in the first half of 2018. It will comprise converging initiatives in joint research, policy dialogue, exchange of best practices, the setting up of platforms for business solutions and look at financing models for sustainable urban development.

The partnership brings together all relevant stakeholders: European and Indian institutions, EU Member States and Indian states, businesses and civil society. The reason for designing the Partnership like this is our firm belief that all both public and private stakeholders need to pull their weight to achieve the goals we have set ourselves

The **EU-Mumbai Partnership** launched in 2013, has looked at innovative solutions to the challenges faced by a megacity and has led to dialogue on all major sectors during 3 years. The partnership has also established solid ties between the EU and Mumbai/Maharashtra – a State that covers approx. 9% of Indian territory and population, and whose GDP is approx. 13% of India's GDP.

Under the EU's **World Cities Programme** experts from Pune, Chandigarh, Mumbai and Navi Mumbai have teamed up with European cities Stuttgart, Lazio and Copenhagen to develop sustainable projects.

The **Ecocities** project, with a € 9 mn. contribution from the EU out of an estimated total cost of € 12 mn., is



World Cities Conference, Mumbai

implemented by the IFC, in Bangalore, Bhubaneswar, Chennai, Jamshedpur and Mumbai. It aims at developing increased use of renewable energies. It promotes clean technology and energy efficiency in the delivery of municipal services, new building construction markets and SME clusters/supply chains; and the replacement of ageing infrastructure by involving the private sector through public private partnerships and other funding mechanisms. The project also catalyses the green building market by promoting resource efficiency.

A technical assistance project, promotes the exchange of best practices in **Sewage treatment and solid waste management in the cities of Mumbai and Delhi.**

The European Union is working with several **Urban Local Bodies** in India to promote integrated urban management actions and improve basic municipal services such as water, sanitation and solid waste management in Raisen, Burhanpur, in Madhya Pradesh ; Kishangarh and Jaisalmer, in Rajasthan; and Solapur, Pune and Ichalkaranji, in Maharashtra.

Participatory governance approaches are promoted with the support of the EU in Ahmedabad, Karnal, Jabalpur and Warangal by strengthening the capacity of municipal staff to develop decentralised waste management systems.

The International Urban Cooperation: Sustainable and Innovative Cities and Regions, launched on 26th April 2017 and to be implemented over the next 3 years, will generalise these results and make them available for other Indian cities. The IUC India programme is part of the worldwide IUC programme and operates in the framework of all the main international urban and climate agendas. It comprises of two components: a) 12 city-to-city pairings of Indian and EU cities for the definition of Local Action Plans in various urban sustainable development fields and b) a sustainable energy and climate mitigation and adaptation programme integrated into the Global Covenant of Mayors movement in the EU and elsewhere. Cities of the programme will be able to contribute to the achievement of India's climate change commitments, and exchange/transfer know-how and capacities with EU cities in the fields of urban sustainable development, energy efficiency and climate action, by accessing the EU market of sustainable innovations and best practices and funding sources/schemes/programmes for implementation of climate actions.

CIRCULAR ECONOMY

While India's material consumption per capita is lower than that of other major economies, it is projected to rise substantially causing overall extraction to increase from 5 billion tonnes per year at present to 15 billion tonnes by 2030. The waste burden, already evident, will increase. Delhi, for example, produces 8,400 tonnes per day, which it is finding difficult to handle.

An EU-India Resource Efficiency Initiative, funded by the EU, was launched in January 2017 to support the newly created Indian Resource Panel in developing strategies for resource efficiency in transport, buildings, renewable energy and waste recovery by promoting partnerships between businesses, NGOs and academia. The project is being implemented together with the Indian Ministry for Environment, Forests and Climate Change and its deliverables will feed into the Indian Resource Panel. Over the next 42 months it will also develop an outreach programme to build awareness of issues and options among agencies in all three groups as well as youth and media. The Resource Efficiency Initiative (REI) in India will thus help to a) define the current and future needs of the country in terms of resources and their management; b) help to define a strategy for a more efficient use of key resources, reducing their environmental and social impact; and c) prepare an action plan for the implementation of the strategy. Furthermore, the action is contributing to the global Sustainable Consumption and Production (SCP) agenda driven by the UN - where India has been supporting a stand alone goal on SCP - and mainstreaming it across the energy, food, water and agriculture sectors for the Post-2015 Development Agenda. Ultimately, this action should contribute to a more sustainable and equitable India in the medium and long term. The EU's **'SWITCH Asia'** programme has worked since 2008 to encourage sustainable growth with low environmental impact from industries and consumers, in cooperation with European retailers, producers and consumer organisations. Fourteen projects are implemented in India so far.



Studying waste management solutions in Sweden

CLEAN AIR

India's recent growth and development has been spectacular. The country is in the midst of a massive wave of urbanization as some 10 million people move to towns and cities each year. However, severe pollution, including air pollution is generated due to the increased traffic, construction and heating with biomass and burning of various forms of waste without control of emissions. India has now a growing number of cities facing ambient air pollution, and the population is directly affected.



Air pollution is a serious health hazard

The EU has recently launched an Air Quality Initiative (€300.000) with the overall objective of a) assisting India in understanding its air quality management needs; b) making available the EU's know-how on air quality (political, regulatory, technical, economic); and c) partnering with India to address air pollution by developing a national strategy for ambient air pollution, especially in urban settings. Action will focus on 3 Indian cities suffering from 3 different air pollution causes before spreading the initiative throughout the country.

FINANCING OF PROJECTS

India's has set numerous and ambitious goals in climate action, whether in the National Solar Mission to implement 100MW of generation capacity by 2022, or its Smart Cities Mission to renew and upgrade 100 cities across India and in other many other fields. Financing this ambition, cannot come only from public resources, whose role is necessarily catalytic. An estimated €95 bn. will be required for solar alone, whilst scaling up SMART cities investment will require many multiples of this amount.

Blending operations

Under the Asia Investment Facility, two projects are being implemented in cooperation with the Agence Française de Développement (AFD). The AIF provides € 15.65 mn to support the projects while the AFD contribution amounts to € 230 mn. Both projects run over the period of five years, between 2016 and 2021.

One of the projects aims to support the development of green housing in India and thus to diminish the negative impacts of housing development on the environment. The project is divided into a financial component and a technical component. The financial component shall make available capacities needed to give out credits and loans to foster sustainable investments. The technical component shall improve the capacities of relevant stakeholders and provide support in elaborating and implementing green housing schemes. The other project supports the reduction of greenhouse gas emissions from urban transportation through the implementation of urban mobility plans in Nagpur, Kochi and Ahmedabad.

The European Investment Bank, as the Bank of European Union, is committed to investing in clean energy, sustainable development and climate related projects, both inside the EU and outside, and specifically in India.

By innovating and sharing risk, the EIB draws private money to climate-action projects alongside public funds. A good example of this is the Global Energy Efficiency and Renewable Energy Fund (GEEREF) which operates as a 'layered-risk' fund. It invests in the kinds of deals 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 mn. investment from Norway, Germany and the EU, 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 €110 million from private investors on the back of that de-risking strategy. Most of that probably would never have been invested in climate action in developing countries without GEEREF.

EIB

The EIB has supported long-term investment across India for more than 20 years. Following commitments made at the EU-India Summit in March 2016, the EU Bank recently opened its South Asia Regional Representation at New Delhi



The EIB finances many wind energy projects

in the presence of Finance Minister, Shri Arun Jaitley. The EU Bank already committed more than € 2 bn., mainly in the areas of infrastructure, energy and climate change projects.

The EIB has signed an agreement with the Government of India for a loan of €450 mn. for the metro project at Lucknow city. Furthermore, a €200 mn. loan to the State Bank of India to support investments in solar power by major Indian corporates has been signed. At the Summit in October 2017, the EIB signed the first tranche of €300 million for the €500 million financing of Bangalore Metro, and an MoU with the International Solar Alliance to continue the Bank's global investments in affordable solar solutions in ISA's member states. These signatures marked the culmination of a record year of climate action finance in India for the EIB, in excess of €1.1 bn. in partnership with India's leading private and public sector entities.

SBI Solar Investments Framework Loan

The €200 mn. financing consists of a framework loan for the support of large, utility scale solar PV projects in India, supporting the development, construction and operation of approximately 730 MW of solar PV plants, along with the associated electrical facilities and civil infrastructure.

IIFCL Framework Loan

The €200 mn. financing operation with the India Infrastructure Financing Company Ltd (IIFCL) signed in 2014 supports a series of investments which contribute to the mitigation of climate change through projects in the Renewable Energy (RE) and Energy Efficiency (EE) sectors. The investments are intended to yield economic benefits to the region through the production of energy from renewable resources, the displacement of imported fuel costs, the expanded use of domestic resources and the reduction of greenhouse gas emissions and other airborne pollutants.