Lecture Description of the Lecture Series in the Winter Semester 2017/2018

“Renewable Future”

October 12, 2017: Accelerating the Global Energy Transition

The energy transition is the pathway for transformation of the global energy sector from a fossil-based to a zero-carbon one by the second half of this century. There are many routes that may take us there, with different combinations of technologies and policies that can be implemented. Government strategies can streamline the transition, maximizing economic and social benefits, wealth creation and inclusion of all stakeholders. Public and private sector roles must be balanced. Accelerated deployment of energy efficiency and renewable energy technologies play a central role. The energy transition will be enabled by information technology and includes smart technology, policy frameworks and market instruments.

The lecture will elaborate the latest IRENA findings on energy transition including technology and sector roadmaps, economics of energy transition and enabling frameworks.

October 26, 2017: Planning for the Transformation of Power Systems

The integration of a high share of variable renewable energy (VRE) in electricity grids, namely wind and solar photovoltaics, is an issue still perceived as a challenge. Concerns are based on how the conventional way to plan, operate, and manage a power system (generation, distribution, transmission, consumption) may not necessarily guarantee the secure and reliable power supply with a high share of VRE. Lessons learnt from a number of front-runner countries have demonstrated that a rapid scale-up in the share of VRE can be achieved, when accompanied by implementation of the appropriate planning, technical, operational and regulatory measures. A holistic approach, with strong stakeholder engagement, reconcile two key goals of policy-makers, which were previously considered as contradictory: (1) to significantly increase the share of VRE to decarbonize the power system, and (2) to ensure the reliable power supply to consumers.

During this lecture, key findings from recently published or under preparation IRENA’s publications on the power sector transformation cluster will be presented. The focus will be on (1) planning long-term transition path to a high share of VRE, (2) planning to overcome operational bottlenecks with a high share of VRE and (3) roles of storage in the integration of VRE into a power system.
November 9, 2017: Island Energy Transitions

Electricity generation in most Island States is dependent on imported refined petroleum products. This dependence, combined with long supply chains and limited purchasing power, means that SIDS have some of the highest electricity generation costs in the world. In comparison, generation from photovoltaics (PV) and wind can be much less expensive making a strong economic case for a transition from fossil fuels to renewables.

Numerous islands have shown that this transition is technically feasible with sustainable operation of islands electricity systems with high shares of renewable energy successfully demonstrated on numerous islands across the world. Kodiak island in the U.S. State of Alaska has used hydro and wind power combined with battery and flywheel electricity storage to meet over 99% of its annual electricity demand with renewables since 2014. King island in Tasmania, Australia, has a power system designed to deliver 65% annual generation using PV and wind generation coupled with storage. In addition, numerous small islands around the globe have used PV coupled with battery storage to support high shares of renewable electricity.

This lecture will detail the economic and technical case for Island moving to renewable based energy systems and detail how IRENA engages with Island governments around the world to support their energy transitions.

November 23, 2017: Approaches to Sustainable Bioenergy

IRENA analysis suggests that modern bioenergy use should triple by 2030 to double the renewable energy share of the overall energy mix. But expansion of bioenergy use has been hampered by skepticism regarding how much expansion is possible while also meeting growing needs for food and carbon sequestration. IRENA has therefore outlined a number of sustainable approaches to greater bioenergy use which can support the goal of sustainable energy for all (SE4All) while also promoting other key sustainable development goals (SDGs) such as food security, climate security and poverty alleviation. These include more thorough harvesting of farm and forest residues, improved crop yields (sustainable intensification), and reduced waste and losses in the food chain.

The lecture will outline each of these pockets of bioenergy potential in the context of a briefing paper on Sustainable Bioenergy Development which has been jointly prepared by FAO, IEA Bioenergy and IRENA.

December 7, 2017: Innovation Driving the Energy Sector Transformation

Renewables have been identified by countries as the foundation for a low-carbon energy system by 2050. This will put us on track towards a zero-carbon energy system in the period 2060 to 2080, as outlined in the Paris Climate Agreement. However, the current business as usual scenario is not in line with such a desired transformative pathway. Scaling up the deployment of
renewable energy is linked to making existing and emerging renewable energy technologies competitive, and to their integration into a dynamic global energy system.

The lecture will elaborate on the role of innovation, across the complete technology lifecycle, in the transformation of the energy sector, and will provide concrete examples of exciting innovations that may become game changers to achieve the climate objectives.


Despite a rise in installed generation capacity worldwide, the deployment of renewable energy can at times be challenging if projects do not meet certain standards to obtain the necessary financial support. Added to this, there are (a) a perception of high technology risk, (b) cumbersome administrative procedures, (c) insufficient transparency in the project cycle, as well as limited access to (d) institutional and (e) commercial financing instruments. IRENA has developed Project Navigator - an online platform providing comprehensive, easily accessible, and practical (f) data, (g) tools and (h) guidance to assist in the development of bankable renewable energy projects. The platform introduces a project lifecycle process structured in several distinct phases designed to support the progressive development of renewable energy projects.

During this lecture, key findings from recently published or under preparation IRENA’s publications on project facilitation will be presented. The focus will be on (1) renewable energy project development overview (2) modelling techniques (3) case studies.

January 25, 2018: The True Costs of Renewables

Up-to-date insights into the competitiveness trends of renewable power generation costs have become an indispensable tool in navigating the rapidly evolving energy landscape. IRENA’s cost data and analysis allow for tailored policy recommendations of sector and market needs and the identification of priority areas for policy implementation. IRENA’ costing analysis banks on a database of more than 15 000 renewable energy projects coupled with a database on Power Purchasing Agreements of more than 5000 projects. With solar and wind power costs falling, sometimes rapidly, up-to-date current cost data and projections in the future provide the compass and map necessary for Member States to plot a least-cost path for their energy transition. IRENA has analyzed solar and wind cost reduction potential and has produced an updated analysis on the wind onshore learning curve and regional competitiveness analysis for solar PV through the PV Parity Indicators analysis framework.

The lecture will cover most aspects of IRENA work related to costs and will share an outlook on future competitiveness of key renewable energy technologies and preliminary results on IRENA’s upcoming analysis for a report on that examines in detail current and projected costs and performance of battery electricity storage technologies to 2030.