

For further information

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Engineering for Development (E4D)

School on Energy, 9 - 28 July 2017
Cape Town, South Africa

Low-Carbon Energy and Development Strategies

In collaboration with ETH Energy Politics Group, Energy Science Center, Institute of
Science, Technology and Policy and the University of Cape Town



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About the programme

BACKGROUND

The E4D School on Energy is part of the programme “Engineering for Development (E4D) – Science & Technology for the South”. The goal of this programme is to promote the development of products or methods which are directly relevant for improving the livelihoods of people in developing countries.

The E4D programme has evolved from a scholarship scheme supported by the Sawiris Foundation for Social Development. Since 2008 it has awarded two doctoral scholarships annually. Since 2014 the scope has been expanded to include a series of summer or winter schools.

E4D SCHOOL ON ENERGY 2017

The E4D School on Energy will be composed of 25–30 graduate students from ETH Zurich, South Africa and other academic institutions around the world, particularly from developing countries. The master and doctoral students will come from different disciplines related to the Engineering for Development topic. They will be joined by faculty members and external experts from fields of expertise related to the winter school topic.

The aim of the E4D School on Energy is to foster interdisciplinary exchange on low-carbon energy development strategies (LCEDS).

The School on Energy will take place at the University of Cape Town in South Africa.

ORGANISERS

ETH GLOBAL

ETH Global is the staff unit for international relations at ETH Zurich. It fosters international partnerships in research and education and enhances the institution’s visibility abroad. ETH Global is responsible for implementing the global strategic goals of ETH Zurich and cooperates with other offices working with international issues. Its crosscutting mission complements the international relations of research groups, departments or administrative units at the institutional level.

ENERGY POLITICS GROUP

The Energy Politics Group forms part of the Governance Section of ETH Zurich’s Department of Humanities, Social and Political Sciences (D-GESS) and is a member of the Centre for Comparable and International Studies. The group analyses questions related to the governance of technological change in the energy sector from a global perspective and includes research on both developed and developing countries. The Chair has developed the curriculum of the programme of the E4D School on Energy 2017 and is responsible for its content.

ENERGY SCIENCE CENTER (ESC)

The ESC of ETH Zurich is an interdepartmental competence centre to facilitate energy research and teaching activities across research fields and departments. The ESC contributes to the integration of specialists and disciplines and it aims to be influential in energy research nationally and internationally.

Clean, affordable, and reliably available energy is of paramount importance to the well-being of modern societies. Developing future environmentally friendly energy systems requires research in a large number of scientific disciplines. Most of these are represented at ETH Zurich, which has an impressive tradition in energy-related research.

More than sixty professors at ETH Zurich currently carry out research projects with direct relevance to energy science and technology.

INSTITUTE OF SCIENCE, TECHNOLOGY AND POLICY (ISTP)

Public policies addressing key challenges of our time rely heavily on new knowledge generated by natural, engineering, and social sciences. The Institute of Science, Technology and Policy (ISTP) of ETH Zurich was founded in September 2015. It is dedicated to supporting public policy-making processes via education of future policy analysts and decision-makers; via exchange of information among scientists, policy-makers, and other members of society and via innovative and productive trans-disciplinary research collaborations.

SAWIRIS FOUNDATION FOR SOCIAL DEVELOPMENT

The Sawiris Foundation for Social Development sponsors the E4D School on Energy. The Sawiris Foundation was founded on the belief that development is only sustainable when its beneficiaries are equal partners in the process.

The Sawiris Foundation supports initiatives that encourage job creation through training, education and access to micro-credit. The Sawiris Foundation also enhances efforts

to improve health and to further the endeavours of local communities to improve infrastructure and gain access to basic services – two important prerequisites for higher productivity and increased empowerment of citizens.

UNIVERSITY OF CAPE TOWN

The University of Cape Town (UCT) is a public university located in Cape Town, South Africa. It is the oldest university in South Africa, founded in 1829, and the highest ranked university in Africa. The language of instruction is English, and approximately 20% of the UCT student body is international students, representing over 100 countries. UCT contributions to teaching and research are well recognised in a variety of fields with benefits for South Africa, Africa and the global community.

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LOW-CARBON ENERGY AND DEVELOPMENT STRATEGIES

Energy and economic development are intricately linked. Historically, fossil fuelled technologies drove economic progress, leading to a coupling of growth with adverse environmental impacts. If developing countries are to leapfrog to an alternate, low-carbon development pathway, they will likely require significant technological and structural changes within the energy sector.

Low-carbon energy and development strategies (LCEDS) that seek to decouple energy use from environmental degradation are becoming a new paradigm for policy-makers. Such strategies are crucial in the electricity sector: currently electricity-related emissions account for the largest share of global CO₂ emissions. At the same time, the provision of reliable and affordable electricity services is necessary for development. Developing such LCEDS is an interdisciplinary challenge ranging from engineering to public policy and political economy.

This E4D School on Energy will cover four subthemes related to LCEDS.

1. Renewable energy technologies

Renewable energy technologies offer a promising solution to decarbonizing the electricity supply. However, these technologies suffer from the capital costs and high risks – characteristics that make their deployment in developing country contexts particularly problematic. During the workshop, students will gain an understanding of the feasibility of these technologies and will design a policy mix to support their deployment.

2. Electricity access

Globally, 1.1 billion people lack access to electricity. Despite goals to provide universal access to modern energy services by 2030, progress on this front has been limited. A key

bottleneck to reaching this goal is closing the finance gap. This subtheme addresses some of the unique challenges related to electrification, with a focus on financing strategies.

3. Fossil fuel subsidies and their reform

Subsidies for the consumption of fossil fuels totalled USD 493 billion in 2014. Fossil fuel subsidies impede sustainable development by crowding out public investment in other development initiatives and encouraging reliance on emissions-intensive fuels. Reforming fossil fuel subsidies is therefore high on international agendas, yet implementing reform in practice has proven politically difficult. In the workshop, students will explore the political challenges of fossil fuel subsidy reform.

4. “Sustainable Development” benefits

Well-designed LCEDS should not only capture direct climate benefits, but also “co-benefits” related to issues such as health, industrial development or equity. Often these “co-benefits” drive the political will for implementing these strategies. Understanding how to capture these synergies between mitigation and development is therefore critical in designing such strategies.

These subthemes will be linked through an extensive case study in which students will work in groups to design a hypothetical LCEDS for a specific case study country. Students will have the opportunity to present these designs to a panel of experts at the end of the winter school session.

Tentative Schedule

	SUNDAY JUL 9	MONDAY JUL 10	TUESDAY JUL 11	WEDNESDAY JUL 12	THURSDAY JUL 13	FRIDAY JUL 14	SATURDAY JUL 15	
morning	Arrival	Introductory group activity	Free time	Renewable energy economic potential (exercise)	Group work	Excursion: Wind Farm		morning
afternoon	Touristic excursion / campus tour	Introductory lecture / Introduction to group work	Renewable energy potential assessment	Group work	Renewable energy investment risks and derisking (lecture)			afternoon
evening	Welcome reception	Energy system analysis	Renewable energy economic potential (lecture)	Introduction to energy finance	Renewable energy investment risks and derisking (exercise)	Group work		evening
		Renewable energy technologies		Energy policy instruments and design	Group work			
		Group Activity						
morning		Political economy of power sector reform	Excursion: Pumped Storage Hydro	Introduction to electricity access	Business models and case studies for electrification	Fossil fuel subsidies and their reform		morning
afternoon		Individual study	Group work	Development impact of electricity access	Finance for electrification	Fossil fuel subsidy reform: Case studies		afternoon
evening		Group work	Film screening	Technology options and trade-offs for expanding electricity access	Constructive controversy	Fossil fuel subsidy reform: Negotiation simulation		evening
				Cultural night	Group work			
morning		Introduction to low-emissions development benefits	Environmental co-benefits	Deep-dive case study, South Africa	Group work	Student presentations	Departure	morning
afternoon		Industrial policy and energy	Sustainable development perspectives	Group work	Group work	Feedback from jury		afternoon
evening		Group work	Group work	Excursion: Small-scale renewables		Closing remarks		evening
						Farewell dinner		