The Boris Mints Institute
for Strategic Policy Solutions to Global Challenges
The Gershon H. Gordon Faculty of Social Sciences
Tel Aviv University

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Production and Distribution of Energy in Israel and the World - Future Trends

This is a unique course, a collaboration between Tel Aviv University and the Eilat-Eilot Renewable Energy Initiative. The course condensed to 5 days in the Arava desert, equivalent to a semester long course of 3 academic credit points. 'Eilat-Eilot', located in the southern Arava, has been operating for the past ten years to enhance the socio-economic and technological development of the region. The heart of Eilat-Eliot's activity is the most predominant local resource – **the sun:** producing clean solar electricity for 100,000 people, promoting technological innovation and cleantech, regulation and policy promotion, international conferences, academic and educational training center and more. The Boris Mints Institute at Tel-Aviv University is an inter-disciplinary research center, working to find strategic policy solutions to global challenges, and includes a renewable energy research lab.

Why energy?

Energy is a field that goes beyond technology and relates to policy, industry, economy, digital information, development and entrepreneurship, and serves as the basis for a worldwide entrepreneurial sector with enormous potential. A paradigm shift in the production and distribution of electricity is occurring through policy and technology. The changes in the global arena open immense possibilities, and insightful entrepreneurs have the ability to become major players in the market. In this course, we will expose students to the main trends taking place in the global energy market: Innovation in the field of electrical network management, Blockchain, exposure to leading Israeli technology, off grid solutions and how an “evolutionary leap” can be made in developing countries in the field of electricity generation, to an innovative concept of a decentralized, digital and advanced electricity economy.

Why in the Arava?

Because of the unique development model that does not exist anywhere else in Israel. The number of technologies and exposure to start-up companies, entering commercial solar fields and test-fields, is an experience which past participants have described as the most significant seminar they had taken during four years of university studies.

What will the course include?

In a world where energy demand is soaring, population is growing, and economic development engines are identifying new markets, important questions are raised regarding the right way to move forward in designing and implementing renewable energy systems. In this course, we will expose student to various innovative practical renewable energy solutions. The course will include academic lectures from top TAU researchers, presentations given by successful entrepreneurs, as well as hands-on experience in fieldwork. The course will be given in English and is suitable for curious Master's students who are eager to make appositive change in the world. Our students come from various disciplines: public policy, engineering, environmental studies, life sciences and other fields.

Main contents:

Sunday – introduction at Tel-Aviv University

- Structure of the electricity sector and regulatory policy processes.
- Future of the electricity market:
  - Distributed energy production.
  - SMART GRID - modernization of electricity systems.
  - SMART CITIES - transferring control to the local authority.
- Energy independence through distributed renewable energy as a basis for national energy security.
- Formulating an environmental worldview: the Paris Agreement, ecological footprint, urban processes and the environment.

Monday – drive south to the Arava

- Visit to Ashalim - 250 megawatts site. Tour of three types of technology: thermo-solar, thermal storage, photovoltaic and gas-fired power generation. After the tour, an open discussion on the project's economic viability, regulatory challenges and the prospect of thermo-solar remaining a relevant player in the energy market.
- Visit at Rotem industrial park - Brenmiller demonstration site: an autonomous system based on thermal storage for energy production. Storing energy at high temperatures (up to 500 degrees) and providing a variety of solutions to the distributed electricity market.
- Renewable energy as a catalyst for regional development - and as an engine for advancing the Field in Israel.

Tuesday – in the Arava

- Tour the first solar field in Israel, and demonstration of solar panel robots for cleaning.
- A world without infrastructure - challenges and economic models for financing technology / service in developing countries.
- Tour of the off-grid demonstration village - what are the needs and challenges in developing countries. Exposure to Israeli energy-food-water technologies and the vision to enter the African market.
- The next revolution - biogas: a workshop composed of a lecture, tour, and coping with the technological challenges that Home Biogas are facing in developing the product.

Wednesday - in the Arava

- Challenges of storage and how they affect the global energy economy - the "Capital Nature" technological incubator.
- Hydrogen based storage and energy systems
- ENERVIBE – Start-up company that has produced a chip which creates energy from movement.
- Pumped storage - technological explanation and the plan to construct a 160 megawatt facility in the Arava.
- Eilat Smart City - urban tour in neighborhoods where Eilat operates efficiency programs.

Thursday – in the Arava and back to Tel Aviv

- Flywheel storage system: applications for the storage and charging of electric vehicles.
- The ENERGY CLOUD - What management changes are expected in electricity networks, and how it will affect consumers and technology.
- Micro-Grid – planning, challenges and opportunities.