Renewable Energy Systems
TU Wien I Energiepark Bruck/Leitha

Postgraduate MSc Program
Master of Science (MSc)
4 semesters, part-time
Renewable energy and energy-efficiency improvements are the cornerstones in heading toward sustainable energy systems. In recent years, electricity production from renewable energy sources has increased significantly in many countries worldwide. Currently, in the EU renewables have become No. 1 in electricity generation. The next challenge is to switch to fully renewable energy systems. The core objective of this post graduate Master’s program is to create experts who will be able to cope with this challenge.

The interdisciplinary part-time MSc Program is offered by TU Wien in cooperation with Energiepark Bruck/Leitha.

TU WIEN
Technology for People - Developing Scientific Excellence and Enhancing Comprehensive Competence

The TU Wien – located in the heart of Europe and Vienna - is the largest Austrian institution in research and education within the areas of technology and natural sciences. Even though the beginnings of TU Wien reach back more than 200 years research, teaching, and learning are state-of-the-art.

ENERGIEPARK BRUCK/LEITHA
Think Globally, Act Locally – more than 20 years of experience in the field of renewable energy and regional development.

The association Energiepark Bruck/Leitha was established in 1995 and acts as an innovation center for renewable energy, energy efficiency, climate protection and regional development. Since then a wide range of renewable energy projects have been realized. Based on Energiepark’s activities the region already reached energy autonomy in the field of power.

FURTHER PARTNERS
Tailor-made country modules are offered to gain in-depth knowledge on energy markets in selected European countries. Contributions will be made by:

AGH-University of Science and Technology (Krakow), Czech Technical University (Prague), Ege University (Izmir), Hamburg University of Technology (Hamburg), University of West Hungary (Sopron), ApE-Agencija za prestrukturiranje energetike (Ljubljana), BGWEA Bulgarian Wind Energy Association (Sofia), and Energetski Institut Hrvoje Pozar (Zagreb).

Become AN EXPERT for the most important topic of your generation

The global economic challenge for the next decades will be the question in availability of energy resources. The dependability of supply and acceptable costs will be of vital importance for all of us – in both industrialized and developing countries.

Never before has the demand for employees in this field been so high. You are required to contribute in-depth knowledge, as well as ensure your own ongoing education to stay abreast of technological progress. In the part-time MSc Program “Renewable Energy Systems” participants will receive the very best preparation for the demands of sustainable energy economics. It will provide them with an opportunity to specialise roles in the challenging and rapidly expanding field of renewable energies and energy efficiency systems.

Our graduates will be able to add impetus to the energy rethink currently underway in different positions in business and society:

- It takes project implementation specialists to plan and operate alternative energy production facilities;
- Financing institutions and governmental agencies will face the challenge of having to competently assess such projects more and more frequently;
- Even conventional energy providers see good business opportunities in this field in the future.

In this growing sector, the demand for well-founded know-how has increased. The complementary strengths of the TU Wien and Energiepark Bruck/Leitha partnership make this MSc Program an outstanding opportunity to satisfy the market demand worldwide.

Univ.Prof.Dr.techn. Reinhard Haas
Academic Director

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## CURRICULUM

**MODULE 1**  
**Introduction on Renewable Energy**

- Non-conventional energy production, energy mix, energy trade, international and European programs and conventions in the sector of renewable energy
- Economic aspects of renewable energy, basic economics, basic management, introduction on risk evaluation and risk management
- Structural planning
- Distribution networks (electric, thermal, gas), feeding-in and control of distribution networks
- Practical examples of network interaction

**MODULE 2**  
**Biomass, Biofuels & Biogas**

- Principles of energetic use of biomass (physical, chemical), available raw material resources, and ecological resource management
- Plant engineering for the energetic use of biomass (electric, thermal, gas, liquid)
- Planning, construction, implementation, operation, and maintenance
- Economic evaluation, risk, and cost aspects
- Practical examples, field trips to existing plants

**MODULE 3**  
**Solar Energy – Solar Heating & Photovoltaics**

- Physical principles of the use of solar energy
- Potentials
- Plant engineering for the use of solar energy (electric, thermal)
- Planning, construction, implementation, operation, and maintenance
- Economic evaluation, risk, and cost aspects
- Practical examples, field trips to existing plants

**MODULE 4**  
**Geothermal Energy, Wind Power & Small Hydro Power**

- Physical principles of energy usage
- Available resources, potentials
- Plant engineering for energy generation (electric, thermal)
- Planning, construction, implementation, operation, and maintenance
- Economic evaluation, risk, and cost aspects
- Practical examples, field trips to existing plants

**MODULE 5**  
**Efficient Energy Use & Thermal Building Optimization**

- Physical principles, energy demand of buildings, building services engineering
- Optimized building concepts, potentials, opportunities
- Energy efficiency in the public sector and in companies
- Outsourcing of energy supply services
- Economic evaluation, risk, and cost aspects
- Analysis of practical examples

**MODULE 6**  
**General Legal & Economical Frameworks**

- Legal aspects of renewable energy according to the EU regulatory system
- Basics of European Community Law
- Austrian national legal basis of renewable energy
- Valuation and financing of energy projects
- Business plans for energy projects
- Financial planning for energy projects
- Principles of accounting
- Tax law
- Investment law / licensing procedure

**MODULE 7**  
**Integration of Renewable Energy Sources into the Energy System**

- Fundamentals of electricity markets and CO2 emissions trading
- Basics of electricity grids
- Future role and responsibilities of transmission grids
- Grid integration of renewables and the concept of smart grids
- Market integration of renewables and storages
- Direct marketing of green electricity
- Example for integrating RES-E into the grid
- Market overviews on renewable energy in Europe, currently in Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovakia, and Slovenia.

**MODULE 8**  
**Management & Soft Skills**

- Operative organization, team building
- Self management, conflict management
- Information work and opinion forming, media relations
- Civic participation
- Presentation, moderation

**MODULE 9**  
**Perspectives on the Use of Renewable Energy**

- Developments in world energy consumption
- Future technologies
- Technology assessment
- Environmental protection and environment-related issues

**MODULE 10**  
**Master’s Thesis**

- A Master’s Thesis is written relating to the student’s occupational activity and focussing on the feasibility of practical implementation.

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*Long-term, sustainable development would be unthinkable without renewable energy sources and efficient use thereof. Europe is world leader in terms of environmental technology and use of renewable energy, and should strive to defend this position. In this quest, the MSc Program can render a valuable contribution by integrating our neighbours in partnership towards joint European action.*

**Dr. Franz Fischler**  
President of European Forum Ajbach  
Honorary President of Ecosocial Forum Europe and(963,149),(999,283)

Subject to modification
ADMISSION REQUIREMENTS
Admission requirements are: completion of a subject-related study program in technical and natural sciences, economics or law at a recognized Austrian or foreign post-secondary institution of education and a minimum of 2 years of professional experience. Persons holding an equivalent educational and professional qualification may also be admitted.

ACCREDITATION
Accredited by ASIIN (Accreditation Agency for Study Programs in Engineering, Informatics, Natural Sciences and Mathematics).

LANGUAGE OF INSTRUCTION
English

DURATION
The part-time program is presented in modules and takes four semesters.

COUNTRY MODULES
To provide the participants with in-depth knowledge on energy markets in Europe, tailor-made country modules are an essential part of this MSc Program. Within the scope of these country modules currently these countries are offered alternating: Bulgaria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovakia, Slovenia, and Turkey. The schedule will include lectures in these countries as well as excursions.

FACULTY
Internationally recognized scientists and professional experts are members of this top-class faculty, based on their sound interdisciplinary specialized knowledge or on their extensive practical experience in the field of renewable energy sources. As a result, the faculty is diverse and extremely dynamic preparing our graduates to face future challenges.

I had the pleasure to participate in this unique program in its first matriculation year 2005. From the very beginning this program was highly valuable while also improving permanently due to maturity, most recently honored by the ASIIN accreditation.

Dr. Günter Maier, MSc
Alumnus
MSc Program

Renewable Energy Systems
TU Wien | Energiepark Bruck/Leitha

Class 2019–2021

PROGRAM START
March 21, 2019

DURATION AND TIME SCHEDULE
The part-time program is presented in modules and takes four semesters.

LOCATIONS
The MSc Program is held on several locations in different countries: Vienna, Bruck/Leitha and at the sites of the country modules of selected European countries: e.g. Bratislava (Slovakia), Bucharest (Romania), Hamburg (Germany), Izmir (Turkey), Krakow (Poland), Ljubljana (Slovenia), Mosonmagyarovar (Hungary), Prague (Czech Republic), Varna (Bulgaria), and Zagreb (Croatia).

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Subject to modification.

Renewables make sense ...
Energize your future!
TUITION FEE
The tuition fee for the MSc Program is EUR 19,500 (VAT-free), excluding travel expenses and cost of room and board.

INFO SESSIONS
Presentations of the MSc Program will be held in the form of info sessions. During these info sessions the Academic Director, program managers and alumni provide you with in-depth information on the program and look forward to answering your questions.

Wed  Nov 21, 2018   6.00 pm (Vienna)
Thu Dec 13, 2018   6.00 pm (online)
Wed Jan 23, 2019   6.00 pm (Vienna)

Please register at newenergy@tuwien.ac.at

ADMISSION/APPLICATION
Application Deadline
Thu Jan 31, 2019

Start Online Application
https://newenergy.tuwien.ac.at

After receiving your complete application, an individual admission interview with the Academic Director and the Program Management is planned. Admission interviews will take place after individual appointment.

FACULTY
Di Dr. Amelia Ajanovic TU Wien
Dr. Horst Brandmaier, MBA OeMag – Abwicklungstelle für Ökostrom AG
Univ.Prof.Dr. Anton Burger Catholic University Eichstätt-Ingolstadt
MR Dr. Gerhard Burian formerly Federal Ministry of Science, Research and Economy
Dr. Benedikt Ennsner Federal Ministry of Science, Research and Economy
Tara Esterl, MSc ALT – Austrian Institute of Technology GmbH
FH-Prof. Dr Hubert Fechner MAS, FH Technikum Wien
ao.Univ.Prof. Dr. Anton Friedl TU Wien
Univ.Prof.Dr.-Ing. Wolfgang Gawlik TU Wien
Univ.Prof. Dr. Reinhard Haas TU Wien
Dr. Julia Hall TU Wien
Dr. Martina Handler Austrian Society for Environment & Technology
Ass.Prof. Di Dr. Michael Harasek TU Wien
Mag. Dr. Michael Hartner TU Wien
Priv.-Doz. Dr. Christoph Hauer Vienna University of Natural Resources and Applied Life Sciences
Mag. Edith Hofer, LL.M. Energy-Control GmbH
Di Marcus Hummel e-THINK - Zentrum für Energiewirtschaft und Umwelt
Johannes Kathan, MSc ALT – Austrian Institute of Technology GmbH
Dr. Marek Kobialka Vienna Insurance Group
Di Dr. Lukas Kranzl TU Wien
Di Andreas Kernn Energiewerke GmbH
Dr. Volker Krey IAKSA
Di Martin Krill Profes - Professional Energy Services GmbH
Mag. Robert Maier Raffeisenlandesbank Niederösterreich Wien AG
Di Michael Mandl tbw research GesmbH
Dr. Gábor Milics, MSc University of West Hungary
Univ.Prof. Dr. Martin Mittelbach Graz University of Technology
Univ.Prof. Dr. Nebojša Nakicenovic i. R. TU Wien
Univ.Prof. Dr. Miklós Neményi Ph.D., DSc University of West Hungary
Di Dr. Mario Ortmann i-Projekte Projektentwicklung & Management GmbH
Di Dr. Christian Panzer CPE-Thinktank e.U.
Univ.Prof. Dr. Bernhard Pelikan Vienna University of Natural Resources and Applied Life Sciences
Di Dr. Reinhard Rauch Karlsruher Institut für Technologie (KIT)
Di Georg W. Reinberg Architekturbüro Reinberg ZT GmbH
Di Dr. Gustav Resch TU Wien
Dr. Rusbeh Rezania Wien Energie GmbH
Dr. Fabian Schipfer TU Wien
Dr. Friedrich Stasny Freelancer
Ass.Prof. Dr. Dr. Karin Stieldorf TU Wien
Mag. Hannes Taubinger Anton Kittel Mühlre Plaika GmbH
Prof.Dr. Pál Valdimarsson Pvald ehf
Dipl.-Päd.Ing. Werner Weiss AEE INTEC
Di Lukas Weißensteiner IP Global Austria
Dr.(ETH) Arthur Wellinger Triple E&M

This represents a selection of the faculty of class 2017–2019.
Renewables make sense …
Energize your future!

This master program is an outstanding opportunity to become part of an international, enthusiastic and extraordinary group of people, sharing the same interests for such a challenging topic. The experiences of this course enable us to contribute to the common goal of securing the supply of green energy at affordable prices in order to maintain our standards of living and reducing dependence on fossil fuels at the same time.

Mag. Anna Katharina Gollob, MSc
Alumna
Study in the most liveable city of the world: Vienna

(Source: 2016 Quality of Living Ranking, Mercer)