



Renewable Energy Systems

TU Wien | Energiepark Bruck/Leitha



Postgraduate MSc Program
Master of Science (MSc)
4 semesters, part-time



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 specialist 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.

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 Energetska Institut Hrvanje Požar (Zagreb).



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 world-wide. 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.

Univ.Prof.Dr.techn. Reinhard Haas

Academic Director

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.

Subject to modification



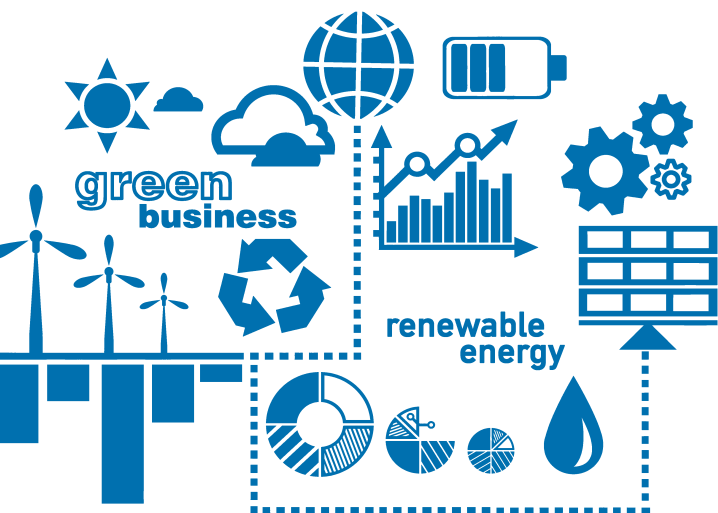
Long-term, sustainable development would be unthinkable without renewable energy sources and efficient use thereof. Europe is world leader in terms of environmental technology and use of renewable energy, and should strive to defend this position. In this quest, the MSc Program can render a valuable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

Dr. Franz Fischler

President of European Forum Alpbach

Honorary President of Ecosocial Forum Europe and Ecosocial Forum Austria / Former EU Commissioner





PROGRAM OBJECTIVES/GOALS

With the MSc Program the participants acquire knowledge and competence for

- the design of plants for the use of renewable energy sources from economic and legal point-of-view,
- the operation of plants for the use of renewable energy sources,
- the future assessment of environmental, technical and economic developments of renewable energy systems.

TARGET GROUP

Individuals within companies, organizations, and authorities who are engaged in planning, operating or evaluation of renewable energy projects or who are involved in financing, promotion, legal licensing of facilities for the use of renewable energy or environmental issues.

FINAL DEGREE

The MSc Program is concluded by writing a Master's Thesis. Achievement of the final degree **"Master of Science (MSc)"** granted by the TU Wien.

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

STUDENT PROFILE



44
Nationalities

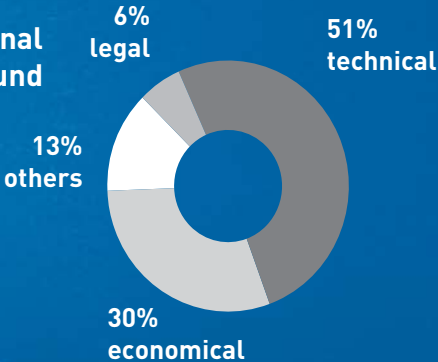


265
Students & Alumni

65%
International students

37 years
Average age

Educational & professional background



**Renewables make sense ...
Energize your future!**

Best University
of Technology
in Austria –
TU Wien

Experienced
international
renewable
energy experts

Austria
as center of
renewable energy
in the EU

International
program with
unique worldwide
network

Practical and
technology-
oriented
program



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)



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