Professional Master's Degree
Renewable Energies

tech global university

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Professional Master's Degree
Renewable Energies

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/engineering/professional-master-degree/master-renewable-energies**

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01

Introduction

Incorporating the knowledge and trends that have emerged in recent times in the Renewable Energy sector requires a huge effort and constant updating from the professionals involved in this field. In this program, TECH has compiled the new vision that sustainable engineering has developed, with the most exhaustive review of the most recognized and valued new techniques and procedures. A complete and innovative study, which puts at your service the intensity of a very broad update, with the flexibility of a high impact and preparatory efficiency method.

An essential program for professionals in the Renewable Energy sector, which will allow you to acquire or expand the most innovative knowledge in this field"

This program is designed as a compendium of the knowledge and updates currently demanded and required by engineering, project consultancy and operation companies in Renewable Energies. A preparatory need that, once acquired, will allow the professionals to open a niche in the market and improve their professional stability.

This update will also help the student to understand in depth the situation of the world energy market and its regulatory framework at the international level, as well as the different parties involved in the financing, management and operation of Renewable Energy projects. It will also help the engineer to recognize the different international renewable technologies in this field.

In parallel, the student's managerial skills and abilities will be developed and enhanced. This will be the main basis for the engineering professional when working in the renewable energy sector in positions of high responsibility.

For all these reasons, this Professional Master's Degree in Renewable Energy will provide with thorough knowledge of the global context, as well as the technical, managerial and economic aspects of the complete cycle of Renewable Energy projects. With this knowledge, the student will be highly competitive in the Renewable Energy industry.

In addition, we have included access to 10 exclusive and complementary Masterclasses, delivered by a prestigious and internationally renowned professor, specialized in Innovation and Renewable Energies and with a remarkable and successful curriculum behind him. Thanks to his guidance, students will acquire the knowledge and skills to excel in this important and in-demand field.

This **Professional Master's Degree in Renewable Energies** contains the most complete and up-to-date program on the market. The most important features include:

- The development of case studies presented by experts in Renewable Energies
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

Apply the latest advances in Renewable Energies in your daily practice and give your resume a boost in value"

With the quality of a teaching method created to combine efficiency and flexibility, giving the professional all the options to achieve their goals with comfort and effectiveness"

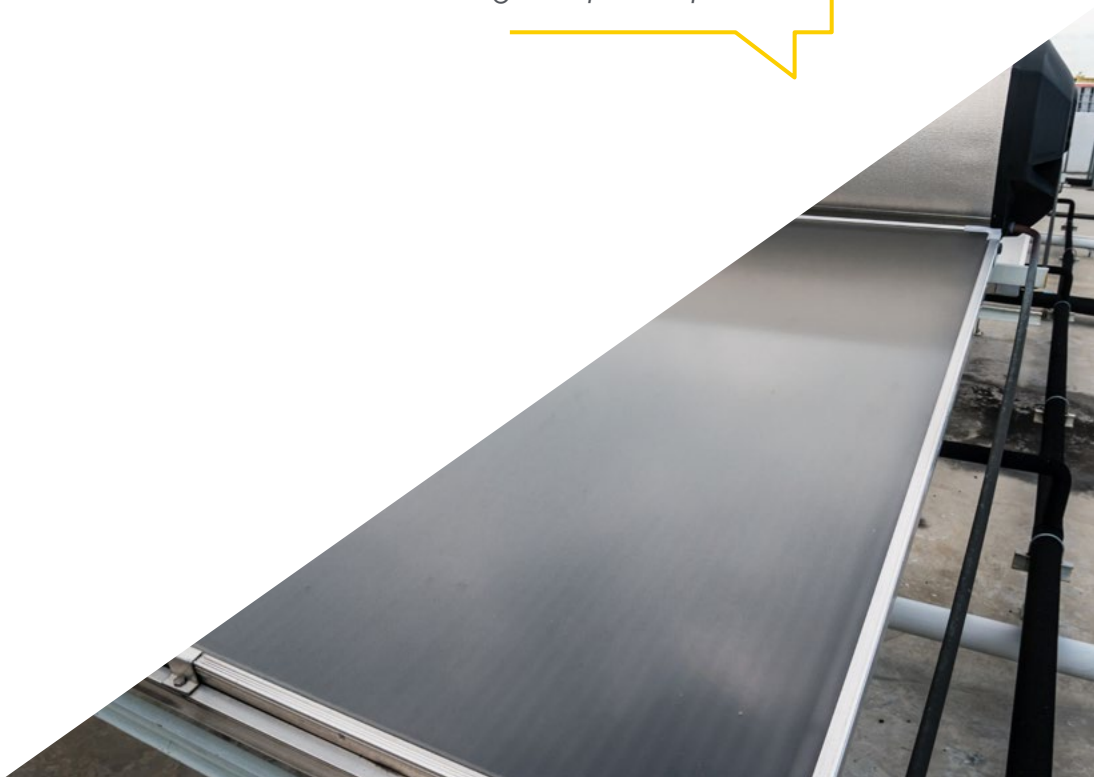
An intensive review that includes the study of the legislation related to Renewable Energies and how its application determines the current development of new projects.

Learn and analyze the latest techniques and developments implemented in this sector at international level, through a high-impact update.

The program's teaching staff includes professionals from the sector who bring the experience of their work to this specialization, in addition to renowned specialists from reference societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will allow the professional a situated and contextual learning, that is, a simulated environment that will provide an immersive refresher programmed for preparing in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

TECH has designed this comprehensive program with the aim of specializing engineering professionals to be able to design, implement and work on Renewable Energy projects, knowing everything related to this industry and the aspects of sustainability and climate change in the international arena that directly affect it. To this end, specific aspects of energy systems will be addressed, which are of great importance in today's business landscape and for which large corporations are increasingly demanding competent engineers with solid specialized education.

With this program we offer engineers and related professionals, a complete specialization that will enable them to work with Renewable Energies with the latest information available"

General objectives

- Conduct an exhaustive analysis of current legislation and the energy system, from electricity generation to the consumption phase, as well as the fundamental production factor in the economic system and the functioning of the different energy markets
- Identify the different phases required for the feasibility and implementation of a Renewable Energy project and its commissioning
- Analyze the different technologies and manufacturers available to create Renewable Energy exploitation systems in depth, and distinguish and critically select those qualities according to costs and their actual implementation
- Identify the operation and maintenance tasks required for the correct operation of Renewable Energy installations
- Size facilities for the application of all energy sources of lesser implementation such as mini-hydro, geothermal, tidal and clean vectors
- Manage and analyze relevant bibliography on a topic related to one or some of the fields Adequately interpret society's expectations on the environment and climate change, and engage in technical discussions and critical opinions on energy aspects of sustainable development, as skills that Renewable Energy professionals should have
- Integrate knowledge and face the complexity of formulating reasoned judgments in the field applicable to a company in the Renewable Energy sector
- Master the different existing solutions or methodologies for the same problem or phenomenon related to Renewable Energies and develop a critical spirit knowing the practical limitations

Specific objectives

Module 1. Renewable Energies and Their Current Environment

- Study the world energy and environmental situation in depth
- Gain detailed knowledge of the current energy and electricity context from different perspectives: structure of the electricity system, operation of the electricity market, regulatory environment, analysis and evolution of the electricity generation system in the short, medium and long term
- Master the technical-economic criteria of generation systems based on the use of conventional energy: nuclear energy, large hydro, conventional thermal, combined cycle and the current regulatory environment of both conventional and renewable generation systems and their dynamics of evolution
- Apply the knowledge acquired to the understanding, conceptualization and modeling of systems and processes in the field of energy technology, particularly in the field of renewable energy sources
- Effectively pose and solve practical problems, identifying and defining the significant elements that constitute them
- Critically analyze data and reach conclusions in the field of energy technology
- Use the acquired knowledge to conceptualize models, systems and processes in the field of energy technology
- Analyze the potential of Renewable Energies and energy efficiency from multiple perspectives: technical, regulatory, economic and market
- Gain the ability to search for information on public websites related to the electricity system and to elaborate this information

Module 2. Hydraulic Energy Systems

- Make an in-depth analysis of hydrology and the management of water resources related to hydropower
- Implementing environmental management mechanisms in the field of hydroelectric energy
- Identify and select the necessary equipment for different types of hydroelectric developments
- Design, dimension and operate of hydroelectric power plants
- Master the elements that make up hydroelectric works and facilities, both in technical and environmental aspects, as well as those connected to operation and maintenance

Module 3. Biomass and Biofuel Energy Systems

- Detailed knowledge of the current situation and future forecasts of the biomass and/or biofuels sectors in the local, provincial, state and European context
- Quantify the advantages and disadvantages of this type of Renewable Energy
- Delve into biomass energy utilization systems, i.e., the ways in which energy can be obtained from biomass
- Assess the biomass resources available in a given area, called the study area
- Differentiate the types of energy crops that exist today, their advantages and disadvantages
- Typify the biofuels used today Understand the processes for obtaining both biodiesel and bioethanol and/or biomethanol
- Conduct comprehensive analyses of legislation and regulations related to biomass and biofuels
- Carry out an economic analysis and gain in-depth knowledge of the legislative and economic frameworks in the biofuels sector

Module 4. Solar Thermal Energy Systems

- Select the necessary equipment for different solar thermal applications
- Be able to make a basic design and dimensioning of low and medium temperature solar thermal installations
- Estimate solar radiation at a given geographical location
- Recognize the conditions and restrictions for the application of solar thermal energy

Module 5. Wind Energy Systems

- Assess the advantages and disadvantages of replacing fossil fuels with Renewable Energies in different situations
- Gain in-depth knowledge to implement wind energy systems and the most appropriate types of technology to be used according to location and economic requirements
- Obtain a scientific-technical vocabulary of Renewable Energies
- Be able to correctly develop hypotheses to address problems in the field of Renewable Energies, and the criterion to assess results in an objective and coherent manner
- Understand and master the fundamental concepts of wind types and the realization of wind measurement systems
- Understand and master the fundamental concepts of the general laws governing the capture of wind energy and wind turbine technologies
- Develop wind power plant projects

Module 6. Grid-Connected and Off-Grid Solar PV Systems

- Master the specific subject matter required to meet the needs of specialized companies and to become highly qualified professionals in the design, construction, assembly, operation and maintenance of photovoltaic solar energy equipment and facilities
- Apply the knowledge acquired to the understanding, conceptualization and modeling of solar photovoltaic installations
- Synthesize knowledge and research appropriate methodologies for integration into innovation and project development departments in any company in the solar photovoltaic field
- Effectively pose and solve practical problems, identifying and defining the significant elements that constitute them
- Apply innovative methods in solving problems related to photovoltaic solar energy
- Identify, find and obtain data on the Internet related to the context of solar photovoltaic energy
- Design and conduct research based on analysis, modeling and experimentation in the field of solar photovoltaic energy
- Gain in-depth knowledge and handle the specific regulations for photovoltaic solar installations
- Gain in-depth knowledge and select the necessary equipment for different solar photovoltaic applications
- Design, dimension, implement, operate and maintain solar photovoltaic installations

Module 7. Other Budding Renewable Energies and Hydrogen as an Energy Vector

- Master the different technologies to use sea energies
- Gain in-depth knowledge and apply geothermal energy
- Associate the physicochemical properties of hydrogen with its potential use as an energy carrier
- Learn about the use of hydrogen as a renewable energy source
- Identify the most commonly used fuel cells and accumulators to date, highlighting the technological improvements throughout history
- Characterize the different types of fuel cells
- Delve into recent advances in the use of new materials for the manufacture of fuel cells and their most innovative applications
- Classify ATEX zones with hydrogen as fuel

Module 8. Hybrid Systems and Storage

- Analyze the importance of electrical energy storage systems in the current energy sector landscape, showing the impact it has on the planning of generation, distribution and consumption models
- Identify the main technologies available in the market, explaining their characteristics and applications
- Have a transversal vision with other sectors in which the deployment of electric storage systems will have an impact on the configuration of new energy models, with special emphasis on the automotive and electric mobility sectors
- Have an overview of the usual steps followed in the development of projects with storage systems, especially focused on batteries
- Identify the main concepts for the integration of storage systems in power generation systems, especially with photovoltaic and wind systems

Module 9. Development, Financing and Feasibility of Renewable Energy Projects

- Gain in-depth knowledge and analyze the technical documentation of Renewable Energy projects required for their feasibility, financing and processing
- Manage technical documentation up to the "Ready to Built" step
- Establish types of financing
- Understand and carry out an economic and financial study of a renewable energy project
- Use all the tools for project management and planning
- Master the part of insurance involved in the financing and viability of Renewable Energy projects, both in their construction and operation phases
- Delve into the processes of valuation and appraisal of claims in Renewable Energy assets

Module 10. Digital Transformation and Industry 4.0 Applied to Renewable Energy Systems

- Optimize processes, both in production and in Operations and Maintenance
- Learn in detail about the capabilities of digital industrialization and automation in Renewable Energy installations
- Gain in-depth knowledge and analyze the different alternatives and technologies offered by digital transformation
- Implement and test IoT (IoT) systems
- Use tools such as Big Data to improve processes and/or energy facilities
- Gain in-depth knowledge of the scope of drones and autonomous vehicles in preventive maintenance
- Learn new forms of energy commercialization Blockchain and Smart Contracts

03

Skills

After passing the evaluations of the Professional Master's Degree in Renewable Energies, the professional will have acquired the necessary skills for a quality practice All knowledge will be developed based on an innovative educational methodology that favors learning. In this way, students will be able to optimally manage with a global vision their intervention in the Renewable Energies environment, from a national and international context and taking into account aspects such as the market, the structure of the electricity system and the development of efficient and effective projects.

This program will allow you to learn about the legislation and the international environment in which new projects that include and contemplate the use of Renewable Energies are being developed"

General skills

- Master the global environment of Renewable Energies, from the international energy context, markets, electricity system structure, to project development, operation and maintenance plans; and in sectors such as insurance and asset management
- Apply acquired knowledge and problem-solving skills in current or unfamiliar environments within broader contexts related to Renewable Energies
- Be able to integrate knowledge and get a thorough understanding of the different sources of Renewable Energies, as well as the importance of their use in today's world
- Learn to communicate concepts of design, development and management of the different Renewable Energy systems
- Gain a detailed understanding of the importance of hydrogen as an energy carrier of the future and large-scale storage within the integration of Renewable Energy systems
- Understand and internalize the scope of digital and industrial transformation applied to Renewable Energy systems for their efficiency and competitiveness in the future energy market
- Be able to critically analyze, assess and synthesize new and complex ideas related to the field of Renewable Energies
- Be able to promote, in professional contexts, technological, social or cultural progress within a knowledge-based society

Specific skills

- Gain in-depth knowledge of the potential of Renewable Energies from multiple perspectives: technical, regulatory, economic and market
- Project, calculate and design products, processes, installations and plants of the most common Renewable Energies in our environment: wind energy, solar thermal energy, solar photovoltaic, biomass and hydropower
- Conduct research, development and innovation in products, processes and methods related to Renewable Energy systems
- Follow the technological evolution of Renewable Energies and have prospective knowledge of this evolution
- Understand the operating principles of the following power generation technologies: solar thermal, mini-hydro, biomass, cogeneration, geothermal, geothermal and wave power
- Master the current state of technical and economic development of these technologies
- Understand the role of the main elements of each technology, their relative importance and the constraints imposed by each of them
- Identify the existing alternatives for each technology, as well as the advantages and disadvantages of each of them
- Be able to assess the resource potential and perform basic sizing for solar thermal, mini-hydro and biomass power plants
- Have a transversal vision with other sectors in which the deployment of electric storage systems will have an impact on the configuration of new energy models
- Gain in-depth knowledge of the digital transformation applied to Renewable Energy systems, as well as the implementation and use of the most important tools

04

Course Management

TECH applies a criterion based on high quality in all its programs. This guarantees students that by studying here they will find the best educational content taught by the best professionals in the sector In this sense, this Professional Master's Degree in Renewable Energies counts on highly prestigious professionals in this field, who bring to the program the experience of their years of work, as well as the knowledge acquired from research in the field. All to provide the engineer with a high-level program, which will enable them to practice in national and international environments with greater guarantees of success.

Learn with the best and acquire the knowledge and skills you need to intervene in this area of development with total success"

International Guest Director

Varun Sivaram, Ph.D. is a **physicist, bestselling author** and leading **clean energy technology** expert with a career spanning the corporate, public and academic sectors. In fact, he has served as **Director of Strategy and Innovation at Orsted**, one of the world's leading renewable energy companies with the largest offshore wind power portfolio.

In addition, Dr. Sivaram has served in the U.S. Biden-Harris administration, as Director General for Clean Energy and Innovation, as well as Senior Advisor to Secretary John Kerry, the Special Presidential Climate Envoy to the White House. In this capacity, he was the creator of the First Movers Coalition, a key initiative to foster clean energy innovation globally.

In the academic field, he has directed the Energy and Climate Program at the Council on Foreign Relations. And his influence in the formulation of government policies to support innovation has been remarkable, having advised leaders such as the mayor of Los Angeles and the governor of New York. He has also been recognized as a Young Global Leader by the World Economic Forum.

In addition, Dr. Varun Sivaram has published several influential books, including "Taming the Sun: Innovations to Harness Solar Energy and Power the Planet" and "Energizing America: A Roadmap to Launch a National Energy Innovation Mission", both of which have received accolades from prominent leaders such as Bill Gates. In fact, his contribution to the clean energy field has been recognized internationally, being included in the TIME 100 Next list and incorporated by Forbes in its Forbes 30 Under 30 list in Law and Policy, among other major accolades.

Dr. Sivaram, Varun

- Director of Strategy and Innovation at Ørsted, United States
- Managing Director, Clean Energy and Innovation // Senior Advisor to Secretary John Kerry, U.S. Special Presidential Climate Envoy at The White House
- Chief Technology Officer at ReNew Power
- Strategic Advisor for Energy and Finance on Reforming the Energy Vision at the New York Governor's Office
- Ph.D. in Condensed Matter Physics from Oxford University
- B.S. in Engineering Physics and International Relations from Stanford University.
- Awards: Forbes 30 Under 30, awarded by Forbes magazine
  Grist Top 50 Leaders in Sustainability, awarded by Grist magazine
  MIT TR Top 35 Innovators, awarded by MIT Tech Review Magazine
  TIME 100 Next Most Influential People in the World, awarded by TIME Magazine
- Young Global Leader, awarded by the World Economic Forum
- Member of: Atlantic Council ,Breakthrough Institute , Aventurine Partners

Thanks to TECH, you will be able to learn with the best professionals in the world"

Guest Director

De la Cruz Torres, José

- Degree in Physics and Industrial Electronics Engineering, University of Seville
- Master's Degree in Operations Management by EADA Business School Barcelona
- Master's Degree in Industrial Maintenance Engineering, University of Huelva
- Railway Engineering, UNED
- Responsible for the appraisal, valuation and valuation of technologies and processes of renewable energy generation facilities at RTS International Loss Adjuster

Management

Lillo Moreno, Javier

- Telecommunications Engineer, University of Seville
- Master's Degree in Project Management and Master's Degree in Big Data & Business Analytics, School of Industrial Organization (EOI)
- With an extensive professional career in the Renewable Energy sector of more than 15 years
- Has managed the O&M areas of several companies with high visibility in the sector

Professors

Mr. Silvan Zafra, Álvaro
- Energy Engineer, University of Seville
- Master in Thermal Energy Systems and Business Administration
- Senior Consultant focused on the execution of international E2E projects in the energy sector
- Responsible for the market management of more than 15 GW of installed capacity for clients such as Endesa, Naturgy, Iberdrola, Acciona and Engie

Dr. Gutiérrez, María Delia
- Vice President of Operations at the Tecnológico de Monterrey
- Professional Master's Degree in Environmental Systems at Tecnológico de Monterrey
- PhD in Engineering Science with a major in Energy and Environment from Dartmouth College
- Professor of Climate Change and Energy Use and Ecological Processes for Human Development at Tec de Monterrey

Mr. Serrano, Ricardo
- Director of Andalusia, Willis Towers Watson
- Degree in Law from the University of Seville
- Participation in the design and placement of insurance programs for renewable energy companies and other industrial activities

Mr. Trillo León, Eugenio
- Industrial Engineer specialized in Energy, University of Seville
- Master's Degree in Industrial Maintenance Engineering, University of Huelva
- Postgraduate Diploma in Project Management, UCLA
- CEO of The Lean Hydrogen Company
- Secretary of the Andalusian Hydrogen Association

Mr. Díaz Martin, Jonay Andrés
- Higher industrial engineer specialized in Electricity, University of Las Palmas de Gran Canaria
- Master's Degree in International Logistics and Supply Chain Management, EUDE Business School
- Master's Degree in Integrated Management of Prevention, Quality and Environment, Camilo José Cela University

Mr. Álvarez Morón, Gregorio
- Agricultural Engineer, Rural Engineering, Independent professional
- Director of projects, works and operations, SEIASA (State Mercantile Company of Agrarian Infrastructures)
- Administrator, Bullring of Santa Olalla del Cala, Huelva
- Engineering office, Tharsis Civil Engineering SL
- Site Manager at Grupo Tragsa
- Bilingual High School Teacher, Junta de Andalucía
- Teacher in collaboration with WATS Ingeniería, a Spanish company specialized in water engineering, agronomy, energy and the environment
- Agricultural Engineer, Rural Engineering, ETSIAM, School of Agricultural and Forestry Engineering
- Master's Degree in Occupational Risk Prevention, Specialization in Occupational Safety
- Master's Degree in Teacher Training for Secondary, Baccalaureate and Vocational Training
- ThePowerMBA, Business Expert Program - Business Administration and Management, ThePower Business School
- Environmental Volunteer, Doñana National Park, Spain

Mr. Martín Grande, Ángel
- Director in Chile at Revergy
- Industrial Engineer, University of Seville
- Master's Degree in Occupational Risk Prevention

- MBA in Technical Management in Renewable Energies and Thermal Power Plants
- Operations management of more than 4 GW of solar and wind power plants in Spain, Europe, United Arab Emirates, United States, Peru, Chile, Uruguay and Argentina

Mr. Montoto Rojo, Antonio

- Electronics Engineer, University of Seville
- MBA at Camilo José Cela University
- Account Manager for storage systems at Gamesa Electric

Mr. Pérez García, Fernando

- Insurance Loss Adjuster
- Specialist in the adjustment and appraisal of industrial risks, technical and energy claims, especially in the renewable energy sector (wind, hydro, photovoltaic, solar thermal and biomass)
- National Loss Adjuster Expert (NLAE) by the European Federation of Loss Adjustment Experts (FUEDI)
- European Loss Adjustment Expert (ELAE) by the European Federation of Loss Adjustment Experts (FUEDI)
- Machinery Breakdown and Renewable Energy Specialist
- Liability Specialist
- Specialist in Loss of Profits Associated with Power Plant Losses
- Specialization Course in Analytical and Financial Accounting
- Degree in Technical Industrial Engineering, specialized in Electricity, from the University of Zaragoza

Dr. De la Cal Herrera, José Antonio

- Industrial Engineer, Polytechnical University of Madrid
- MBA in Business Administration and Management from the Business School of Commercial and Marketing Management, ESIC
- PhD from the University of Jaén
- Former Head of the Renewable Energy Department of AGECAM, S.A., Energy Management Agency of Castilla-La Mancha
- Associate Professor in the Department of Business Organization, University of Jaén

Mr. Granja Pacheco, Manuel

- Civil Engineer, Alfonso X El Sabio University
- Master's Degree in Renewable Energy Installation Management and Project Internationalization by ITE (Instituto Tecnológico de la Energía)
- Manages the operations of a company specialized in the development of Renewable Energy projects, with a track record of more than 3,000 MW of projects at national and international level

Mr. Caballero López, Jaime

- Industrial Technical Engineer Expert in Photovoltaic Energy and Solar Energy
- Shift Manager at Helioenergy Thermosolar Platform, Rioglass Servicios SLU
- Expert in Photovoltaic Energy and Solar Energy
- Shift Manager at the Helioenergy Thermosolar Platform, Abengoa Solar
- Pressure Equipment Commissioning Manager, Siemens Solar Thermal Power Plant in Spain and Portugal
- Supervision and Control Manager in Construction and commissioning of Soleval I Thermosolar Plant (50 MW) Lebrija, Atisae
- Production and Personnel Management at Helioenergy I and II Solar Thermal Platform, Abengoa Solar
- Control Room Operator at Helioenergy I and II Thermosolar Platform, Bester Generación
- Technical Industrial Engineering with Mechanical Specialty, University of Seville
- Professional Master's Degree in Industrial Engineering and Maintenance Management, University of Seville
- Expert in operations from Control Room to Plant, with METSO program
- International Certification Project Management-Mainfor in Technological and Educational Innovation

Mr. Despouy Zulueta, Ignacio

- Project Manager and Discipline Manager at WSP CHILE
- Founder and Senior Consultant at Eficiencia Ambiental SpA.
- Business Developer at Kintlein & Ose GMBH & co. (Joint Venture)
- Project Manager at Arcadis Chile
- Degree in Civil Hydraulic Engineering with specialization in Hydraulics, Sanitary and Environmental Engineering from the University of Chile
- Master's Degree in Environment and Resource Management from Vrije Universiteit, Amsterdam
- Diploma in European Energy Manager from the Chilean-German Chamber of Commerce

05

Structure and Content

The syllabus of the program is structured as a comprehensive tour through each and every one of the concepts required to understand and work in this field. Therefore, through an innovative educational approach based on the practical application of the contents, the engineer will learn and understand the operation of Renewable Energies, knowing how to design and implement projects in this sense, and provide high levels of safety and services to companies. This, in addition to adding value to your professional profile, will make you a much better prepared professional to work in a variety of environments.

A comprehensive syllabus focused on acquiring knowledge and converting it into real skills, created to propel you to excellence"

Module 1. Renewable Energies and Their Current Environment

1.1. Renewable Energies
- 1.1.1. Fundamental Principles
- 1.1.2. Conventional Energy Forms vs. Renewable Energy
- 1.1.3. Advantages and Disadvantages of Renewable Energies

1.2. International Context of Renewable Energies
- 1.2.1. Basics of Climate Change and Energy Sustainability Renewable Energies vs. Non-Renewable Energies
- 1.2.2. Decarbonization of the World Economy. From the Kyoto Protocol to the Paris Agreement in 2015 and the 2019 Madrid Climate Summit
- 1.2.3. Renewable Energies in the Global Energy Context

1.3. Energy and International Sustainable Development
- 1.3.1. Carbon Markets
- 1.3.2. Clean Energy Certificates
- 1.3.3. Energy vs. Sustainability

1.4. General Regulatory Framework
- 1.4.1. International Energy Regulation and Directives
- 1.4.3. Auctions in the Renewable Electricity Sector

1.5. Electricity Markets
- 1.5.1. System Operation with Renewable Energies
- 1.5.2. Regulation of Renewable Energies
- 1.5.3. Participation of Renewable Energies in the Electricity Markets
- 1.5.4. Operators in the Electricity Market

1.6. Structure of the Electrical System
- 1.6.1. Generation of the Electrical System
- 1.6.2. Transmission of the Electrical System
- 1.6.3. Distribution and Operation of the Market
- 1.6.4. Marketing

1.7. Distributed Generation
- 1.7.1. Concentrated Generation vs. Distributed Generation
- 1.7.2. Self-Consumption
- 1.7.3. Generation Contracts

1.8. Emitters
- 1.8.1. Measuring Energy
- 1.8.2. Greenhouse Gases in Power Generation and Use
- 1.8.3. Emission Assessment by Type of Energy Generation

1.9. Energy Storage
- 1.9.1. Types of Cells
- 1.9.2. Advantages and Disadvantages of Cells
- 1.9.3. Other Energy Storage Technologies

1.10. Main Technologies
- 1.10.1. Energies of the Future
- 1.10.2. New Uses
- 1.10.3. Future Energy Contexts and Models

Module 2. Hydraulic Energy Systems

2.1. Water, a Natural Resource. Hydraulic Energy
- 2.1.1. Water in Earth. Water Flows and Uses
- 2.1.2. The Cycle of Water
- 2.1.3. First Uses of Hydraulic Energy

2.2. From Hydraulic to Hydroelectric Energy
- 2.2.1. Origin of Hydroelectric Development
- 2.2.2. The Hydroelectric Plant
- 2.2.3. Current Uses

2.3. Types of Hydroelectric Power Plants by Power Output
- 2.3.1. Major Hydraulic Plant
- 2.3.2. Mini and Micro Hydraulic Plant
- 2.3.3. Constraints and Future Prospects

2.4. Types of Hydroelectric Power Plants by Layout
- 2.4.1. Plant at the Foot of a Dam
- 2.4.2. Flowing Plant
- 2.4.3. Conduction Plant
- 2.4.4. Hydroelectric Pump Plant

2.5. Hydraulic Elements of a Plant
- 2.5.1. Catchment and Intake Works
- 2.5.2. Forced Conduit Connection
- 2.5.3. Discharge Conduit

2.6. Electromechanical Elements of a Plant
- 2.6.1. Turbine, Generator, Transformer and Power Line
- 2.6.2. Regulation, Control and Protection
- 2.6.3. Automation and Remote Control

2.7. The Key Element: the Hydraulic Turbine
- 2.7.1. Operation
- 2.7.2. Typology
- 2.7.3. Selection Criteria

2.8. Calculation of Use and Dimensioning
- 2.8.1. Available Power: Flow Rate and Head
- 2.8.2. Electrical Power
- 2.8.3. Performance. Production

2.9. Administrative and Environmental Aspects
- 2.9.1. Benefits and Drawbacks
- 2.9.2. Administrative Procedures. Grants
- 2.9.3. Environmental Impact

2.10. Design and Project of a Mini-Hydroelectric Plant
- 2.10.1. Design of a Mini-Plant
- 2.10.2. Cost Analysis
- 2.10.3. Economic Viability Analysis

Module 3. Biomass and Biofuel Energy Systems

3.1. Biomass as an Energy Resource of Renewable Origin
- 3.1.1. Fundamental Principles
- 3.1.2. Origins, Typologies and Current Uses
- 3.1.3. Main Physicochemical Parameters
- 3.1.4. Products Obtained
- 3.1.5. Quality Standards for Solid Biofuels
- 3.1.6. Advantages and Disadvantages of the Use of Biomass in Buildings

3.2. Physical Conversion Processes. Pre-Treatments
- 3.2.1. Justification
- 3.2.2. Types of Processes
- 3.2.3. Cost and Profitability Analysis

3.3. Main Chemical Conversion Processes of Residual Biomass. Products and Uses
- 3.3.1. Thermochemicals
- 3.3.2. Biochemicals
- 3.3.3. Other Processes
- 3.3.4. Analysis of Investment Profitability

3.4. Gasification Technology: Technical and Economic Aspects. Advantages and Disadvantages
- 3.4.1. Scope of Application
- 3.4.2. Biomass Requirements
- 3.4.3. Types of Gasifiers
- 3.4.4. Properties of Syngas
- 3.4.5. Usses of Syngas
- 3.4.6. Existing Technologies at Commercial Level
- 3.4.7. Profitability Analysis
- 3.4.8. Advantages and Disadvantages

3.5. Pyrolysis. Products Obtained and Costs. Advantages and Disadvantages
- 3.5.1. Scope of Application
- 3.5.2. Biomass Requirements
- 3.5.3. Types of Paralysis
- 3.5.4. Resulting Products
- 3.5.5. Cost Analysis (CAPEX and OPEX). Economic Profitability
- 3.5.6. Advantages and Disadvantages

3.6. Biomethanization
- 3.6.1. Scope of Application
- 3.6.2. Biomass Requirements
- 3.6.3. Main Technologies. Codigestion
- 3.6.4. Products Obtained
- 3.6.5. Uses of Biogas
- 3.6.6. Cost Analysis. Study of Investment Profitability

3.7. Design and Evolution of Biomass Energy Systems
- 3.7.1. Sizing of a Biomass Combustion Plant for Electric Power Generation
- 3.7.2. Biomass Installation in a Public Building. Sizing and Calculating the Storage System. Determining Payback in Case of Substitution by Fossil Fuels (Natural Gas and Diesel C)
- 3.7.3. Calculation an Industrial Biogas Production System
- 3.7.4. Assessment of Biogas Production at a MSW Landfill Site

3.8. Designing Business Models Based on the Technologies Studied
- 3.8.1. Gasification in Self-Consumption Mode Applied to the Agri-Food Industry
- 3.8.2. Biomass Combustion Using the ESE Model Applied to the Industrial Sector
- 3.8.3. Obtaining Biochar From By-Products of the Olive Oil Sector
- 3.8.4. Production of Green H2 From Biomass
- 3.8.5. Obtaining Biogas From By-Products of the Olive Oil Industry

3.9. Analyzing the Profitability of a Biomass Project. Applicable Legislation, Incentives and Financing
- 3.9.1. Structure of an Investment Project: CAPEX, OPEX, Income/Savings, TIR, VAN and Payback
- 3.9.2. Aspects to be Taken Into Account: Electrical Infrastructure, Access, Space Availability, etc
- 3.9.3. Applicable Legislation
- 3.9.4. Administrative Procedures. Planning
- 3.9.5. Incentives and Financing

3.10. Conclusions. Environmental, Social and Energy Aspects Associated with Biomass
- 3.10.1. Bioeconomy and Circular Economy
- 3.10.2. Sustainability. CO2 Emissions Avoided. C Sinks
- 3.10.3. Alignment With UN SDGs and Green Pact Goals
- 3.10.4. Employment Generated by Bioenergy. Value Chain
- 3.10.5. Contribution of Bioenergy to the Energy Mix
- 3.10.6. Productive Diversification and Rural Development

Module 4. Solar Thermal Energy Systems

4.1. Solar Radiation and Solar Thermal Systems
- 4.1.1. Fundamental Principles of Solar Radiation
- 4.1.2. Radiation Components
- 4.1.3. Market Evolution in Solar Thermal Systems

4.2. Static Solar Collectors: Description and Efficiency Measurement
- 4.2.1. Classification and Components of the Collector
- 4.2.2. Losses and Energy Conversion
- 4.2.3. Characteristic Values and Collector Efficiency

4.3. Applications of Low Temperature Solar Collectors
- 4.3.1. Technology Development
- 4.3.2. Types of Solar Heating and DHW Systems
- 4.3.3. Sizing Installations

4.4. DHW or Air Conditioning Systems
- 4.4.1. Main Elements of the Facilities
- 4.4.2. Assembly and Maintenance
- 4.4.3. Calculation Methods and Control of Facilities

4.5. Medium Temperature Solar Thermal Systems
- 4.5.1. Types of Concentrators
- 4.5.2. The Parabolic Trough Collector
- 4.5.3. Solar Tracking System

4.6. Design of a Solar System with Parabolic Trough Collectors
- 4.6.1. The Solar Field. Main Components of the Parabolic Trough Collector
- 4.6.2. Solar Field Sizing
- 4.6.3. The HTF System

4.7. Operation and Maintenance of Solar Systems with Parabolic Trough Collectors
- 4.7.1. Power Generation Process Through the CCP
- 4.7.2. Solar Field Maintenance and Cleaning
- 4.7.3. Preventive and Corrective Maintenance

4.8. High-Temperature Solar Thermal Systems. Tower Plants
- 4.8.1. Designing a Tower Plant
- 4.8.2. Heliostat Field Sizing
- 4.8.3. Molten Salt System

4.9. Thermoelectric Generation
- 4.9.1. The Rankine Cycle
- 4.9.2. Theoretical Foundations of Turbine-Generators
- 4.9.3. Characterizing a Solar Thermal Power Plant

4.10. Other High-Concentration Systems: Parabolic Dishes and Solar Ovens
- 4.10.1. Types of Concentrators
- 4.10.2. Tracking Systems and Main Elements
- 4.10.3. Applications and Differences Compared to Other Technologies

Module 5. Wind Energy Systems

5.1. The Wind as a Natural Resource
- 5.1.1. Wind Behavior and Classification
- 5.1.2. The Wind Resource in our Planet
- 5.1.3. Wind Resource Measurements
- 5.1.4. Wind Energy Prediction

5.2. Wind Energy
- 5.2.1. Wind Energy Evolution
- 5.2.2. Temporal and Spatial Variability of the Wind Resource
- 5.2.3. Wind Energy Applications

5.3. The Wind Turbine
- 5.3.1. Types of Wind Turbines
- 5.3.2. Parts of a Wind Turbine
- 5.3.3. Functioning of a Wind Turbine

5.4. Wind Generator
- 5.4.1. Asynchronous Generators: Wound Rotor
- 5.4.2. Asynchronous Generators: Squirrel Cage
- 5.4.3. Synchronous Generators: Independent Excitation
- 5.4.4. Permanent Magnet Synchronous Generators

5.5. Site Selection
- 5.5.1. Basic Criteria
- 5.5.2. Specific Aspects
- 5.5.3. Onshore and Offshore wind energy facilities

5.6. Operation of a Wind Farm
- 5.6.1. Operating Model
- 5.6.2. Control Operations
- 5.6.3. Remote Operation

5.7. Wind Park Maintenance
- 5.7.1. Types of Maintenance: Corrective, Preventive and Predictive
- 5.7.2. Main Failures
- 5.7.3. Machine Improvement and Resource Organization
- 5.7.4. Maintenance Costs (OPEX)

5.8. Wind Energy Impact and Environmental Maintenance
- 5.8.1. Impact on Flora and Erosion
- 5.8.2. Impact on Avifauna
- 5.8.3. Visual and Sound Impact
- 5.8.4. Environmental Maintenance

5.9. Data and Performance Analysis
- 5.9.1. Energy Production and Revenue
- 5.9.2. Key Performance Indicators, KPIs
- 5.9.3. Wind Park Performance

5.10. Wind Park Design
- 5.10.1. Design Considerations
- 5.10.2. Wind Turbine Arrangement
- 5.10.3. Effect of the Trails on the Distance Between Wind Turbines
- 5.10.4. Medium and High Voltage Equipment
- 5.10.5. Installation Costs (CAPEX)

Module 6. Grid-Connected and Off-Grid Solar PV Systems

6.1. Photovoltaic Solar Energy. Equipment and Environment
- 6.1.1. Fundamental Principles of Photovoltaic Solar Energy
- 6.1.2. Situation in the Global Energy Sector
- 6.1.3. Main Components of Solar Facilities

6.2. Photovoltaic Generators. Operating Principles and Characterization
- 6.2.1. Solar Cell Operation
- 6.2.2. Design Rules. Characterizing the Module: Parameters
- 6.2.3. The I-V Curve
- 6.2.4. Module Technologies in Today's Market

6.3. Grouping Photovoltaic Modules
- 6.3.1. Photovoltaic Generator Design: Orientation and Inclination
- 6.3.2. Photovoltaic Generator Installation Structures
- 6.3.3. Solar Tracking Systems. Communication Environment

6.4. Energy Conversion. The Investor
- 6.4.1. Types of Investors
- 6.4.2. Characterization
- 6.4.3. Maximum Power Point Tracking (MPPT) and PV Inverter Performance Monitoring Systems

6.5. Transformer Station
- 6.5.1. Functioning and Parts of a Transformer Station
- 6.5.2. Sizing and Design Issues
- 6.5.3. The Market and Choosing Equipment

6.6. Other Systems of a Solar PV Plant
- 6.6.1. Supervision and Control
- 6.6.2. Security and Surveillance
- 6.6.3. Substation and HV

6.7. Grid-Connected Photovoltaic Systems
- 6.7.1. Design of Large-Scale Solar Parks. Prior Studies
- 6.7.2. Self-Consumption
- 6.7.3. Simulation Tools

6.8. Isolated Photovoltaic Systems
- 6.8.1. Elements of an Isolated Facility Regulators and Solar Batteries
- 6.8.2. Uses: Pumping, Lighting, etc
- 6.8.3. Solar Democratization

6.9. Operation and Maintenance of Photovoltaic Installations
- 6.9.1. Maintenance Plans
- 6.9.2. Personnel and Equipment
- 6.9.3. Maintenance Management Software

6.10. New Lines of Improvement in Photovoltaic Parks
- 6.10.1. Distributed Generation
- 6.10.2. New Technologies and Trends
- 6.10.3. Automation

Module 7. Other Emerging Renewable Energies and Hydrogen as an Energy Vector

7.1. Current Situation and Outlook
- 7.1.1. Applicable Legislation
- 7.1.2. Current Situation and Future Models
- 7.1.3. Incentives and Financing R&D&I

7.2. Energies of Marine Origin I: Tidal Energy
- 7.2.1. Tidal Energy Origin and Potential
- 7.2.2. Technologies for Harnessing Tidal Energy
- 7.2.3. Costs and Environmental Impact of Tidal Energy

7.3. Energies of Marine Origin II: Wave Power
- 7.3.1. Wave Energy Origin and Potential
- 7.3.2. Technologies for Harnessing Wave Energy
- 7.3.3. Costs and Environmental Impact of Wave Energy

7.4. Energies of Marine Origin III: Tidal Energy
- 7.4.1. Origin and Potential of Tidal Energy
- 7.4.2. Technologies for Harnessing Maremothermal Energy
- 7.4.3. Costs and Environmental Impact of Maremothermal Energy

7.5. Geothermal Energy
- 7.5.1. Potential of Geothermal Energy
- 7.5.2. Technologies for Harnessing Geothermal Energy
- 7.5.3. Costs and Environmental Impact of Tidal Energy

7.6. Applications of the Studied Technologies
- 7.6.1. Applications
- 7.6.2. Cost and Profitability Analysis
- 7.6.3. Productive Diversification and Rural Development
- 7.6.4. Advantages and Disadvantages

7.7. Hydrogen as an Energy Carrier
- 7.7.1. Adsorption Process
- 7.7.2. Heterogeneous Catalysis
- 7.7.3. Hydrogen as an Energy Carrier

7.8. Generation and Integration of Hydrogen in Renewable Energy Systems. "Green Hydrogen"
- 7.8.1. Hydrogen Production
- 7.8.2. Hydrogen Storage and Distribution
- 7.8.3. Use and Applications of Hydrogen

7.9. Fuel Cells and Electric Vehicles
- 7.9.1. Fuel Cell Operation
- 7.9.2. Types of Fuel Cells
- 7.9.3. Applications: Portable, Stationary or Transport Applications
- 7.9.4. Electric Vehicles, Drones, Submarines, etc

7.10. Safety and ATEX Regulations
- 7.10.1. Current Legislation
- 7.10.2. Ignition Sources
- 7.10.3. Risk Assessment
- 7.10.4. Classificaion of ATEX Zones
- 7.10.5. Work Equipment and Tools to be Used in ATEX Zones

Module 8. Hybrid Systems and Storage

8.1. Electric Storage Technologies
- 8.1.1. The Importance of Energy Storage in the Energy Transition
- 8.1.2. Energy Storage Methods
- 8.1.3. Main Storage Technologies

8.2. Industry Vision of Electrical Storage
- 8.2.1. Automobiles and Mobility
- 8.2.2. Stationary Applications
- 8.2.3. Other Applications

8.3. Elements of a Battery Energy Storage System (BESS)
- 8.3.1. Batteries
- 8.3.2. Adaptation
- 8.3.3. Control

8.4. Integration and Applications of BESS in Power Grids
- 8.4.1. Storage System Integration
- 8.4.2. Applications in Networked Systems
- 8.4.3. Applications in Off-Grid and Microgrid Systems

8.5. Business Models I
- 8.5.1. Stakeholders and Business Structures
- 8.5.2. Viability of Projects with BESS
- 8.5.3. Risk Management

8.6. Business Models II
- 8.6.1. Project Construction
- 8.6.2. Performance Assessment Criteria
- 8.6.3. Operation and Maintenance

8.7. Lithium-Ion Batteries
- 8.7.1. The Evolution of Batteries
- 8.7.2. Main Components
- 8.7.3. Technical and Safety Considerations

8.8. Hybrid PV Systems with Storage
- 8.8.1. Design Considerations
- 8.8.2. PV + BESS Services
- 8.8.3. Studied Typologies

8.9. Hybrid Wind Systems With Storage
- 8.9.1. Design Considerations
- 8.9.2. Wind + BESS Services
- 8.9.3. Studied Typologies

8.10. The Future of Storage Systems
- 8.10.1. Technological Trends
- 8.10.2. Economic Outlooks
- 8.10.3. Storage Systems in BESS

Module 9. Development, Financing and Feasibility of Renewable Energy Projects

9.1. Identifying Stakeholders
- 9.1.2. Developers, Engineering and Consulting Companies
- 9.1.3. Investment Funds, Banks and Other Stakeholders

9.2. Development of Renewable Energy Projects
- 9.2.1. Main Stages of Development
- 9.2.2. Main Technical Documentation
- 9.2.3. Sales Process. RTB

9.3. Renewable Energy Project Assessment
- 9.3.1. Technical Feasibility
- 9.3.2. Commercial Feasibility
- 9.3.3. Environmental and Social Feasibility
- 9.3.4. Legal Feasibility and Associated Risks

9.4. Financial Bases
- 9.4.1. Financial Knowledge
- 9.4.2. Analysis of Financial Statements
- 9.4.3. Financial Modeling

9.5. Economic Assessment of Renewable Energy Projects and Companies
- 9.5.1. Fundamentals of Valuation
- 9.5.2. Valuation Methods
- 9.5.3. Calculating Project Profitability and Fundability

9.6. Financing of Renewable Energies
- 9.6.1. Characteristics of Project Finance
- 9.6.2. Structuring the Financing
- 9.6.3. Risks in Financing

9.7. Renewable Asset Management: Asset Management
- 9.7.1. Technical Supervision
- 9.7.2. Financial Supervision
- 9.7.3. Claims, Permit Monitoring and Contract Management

9.8. Insurance in Renewable Energy Projects. Construction Phase
- 9.8.1. Developer and Builder. Specialized Insurance
- 9.8.2. Construction Insurance-CAR
- 9.8.3. Professional Insurance
- 9.8.4. Advance Loss of Profit Clause(ALOP) ALOP

9.9. Insurance in Renewable Energy Projects. Operation and Exploitation Phase
- 9.9.1. Property Insurance. Multirisk-OAR
- 9.9.2. O&M Contractor's CR or Professional Insurance
- 9.9.3. Suitable Coverage. Consequential and Environmental Losses

9.10. Valuation and Appraisal of Damages in Renewable Energy Assets
- 9.10.1. Industrial Valuation and Appraisal Services: Renewable Energy Installations
- 9.10.2. Intervention and Policy
- 9.10.3. Property Damages and Consequential Losses
- 9.10.4. Types of Claims: Photovoltaic, Thermal, Hydroelectric and Wind Power

Module 10. Digital Transformation and Industry 4.0 Applied to Renewable Energy Systems

10.1. Current Situation and Outlook
- 10.1.1. Current Status of Technologies
- 10.1.2. Trend and Evolution
- 10.1.3. Challenges and Future Opportunities

10.2. Digital Transformation Applied to Renewable Energy Systems
- 10.2.1. The Era of Digital Transformation
- 10.2.2. The Digitization of Industry
- 10.2.3. 5G Technology

10.3. Automation and Connectivity: Industry 4.0
- 10.3.1. Automated Systems
- 10.3.2. Connectivity
- 10.3.3. The Importance of the Human Factor Key Factor

10.4. Lean Management 4.0
- 10.4.1. Lean Management 4.0
- 10.4.2. Benefits of Lean Management in Industry
- 10.4.3. Lean Tools in the Management of Renewable Energy Installations

10.5. Mass Catchment Systems. IoT
- 10.5.1. Sensors and Actuators
- 10.5.2. Continuous Data Monitoring
- 10.5.3. Big Data
- 10.5.4. SCADA Systems

10.6. IoT Project Applied to Renewable Energies
- 10.6.1. Structure of the Monitoring System
- 10.6.2. IoT System Architecture
- 10.6.3. Cases Applied to IoT

10.7. Big Data and Renewable Energies
- 10.7.1. The Principles of Big Data
- 10.7.2. Big Data Tools
- 10.7.3. Usability in the Energy and REE Sector

10.8. Proactive or Predictive Maintenance
- 10.8.1. Predictive Maintenance and Fault Diagnosis
- 10.8.2. Instrumentation: Vibrations, Thermography, Damage Analysis and Diagnosis Techniques
- 10.8.3. Predictive Models

10.9. Drones and Automated Vehicles
- 10.9.1. Main Characteristics
- 10.9.2. Uses of Drones
- 10.9.3. Uses of Autonomous Vehicles

10.10. New Forms of Energy Commercialization. Blockchain y Smart Contracts
- 10.10.1. Information Systems Using Blockchain
- 10.10.2. Tokens and Smart Contracts
- 10.10.3. Present and Future Applications for the Electrical Sector
- 10.10.4. Available Platforms and Blockchain-Based Application Cases

A unique learning opportunity that will catapult your career to the next level"

06

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

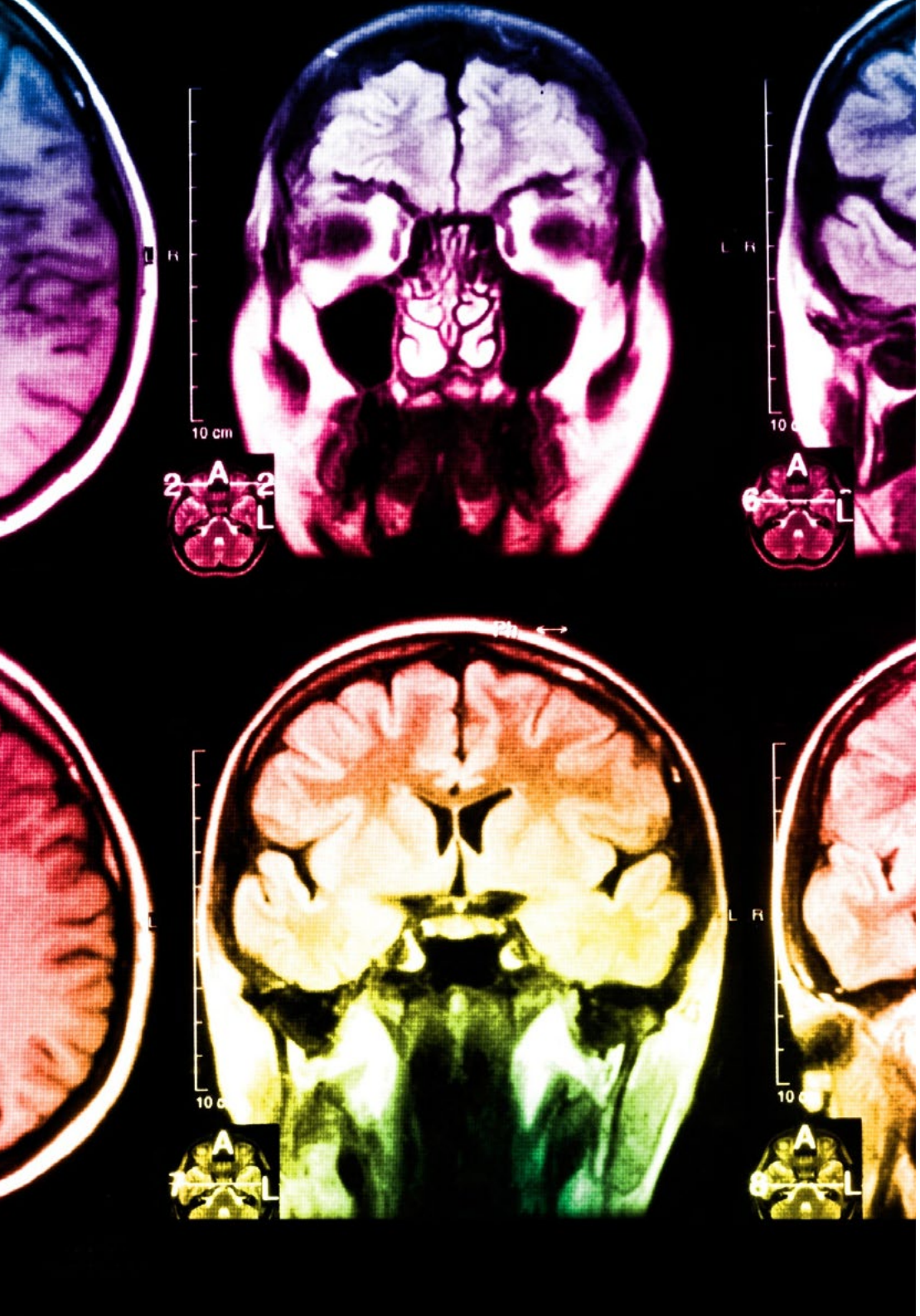
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

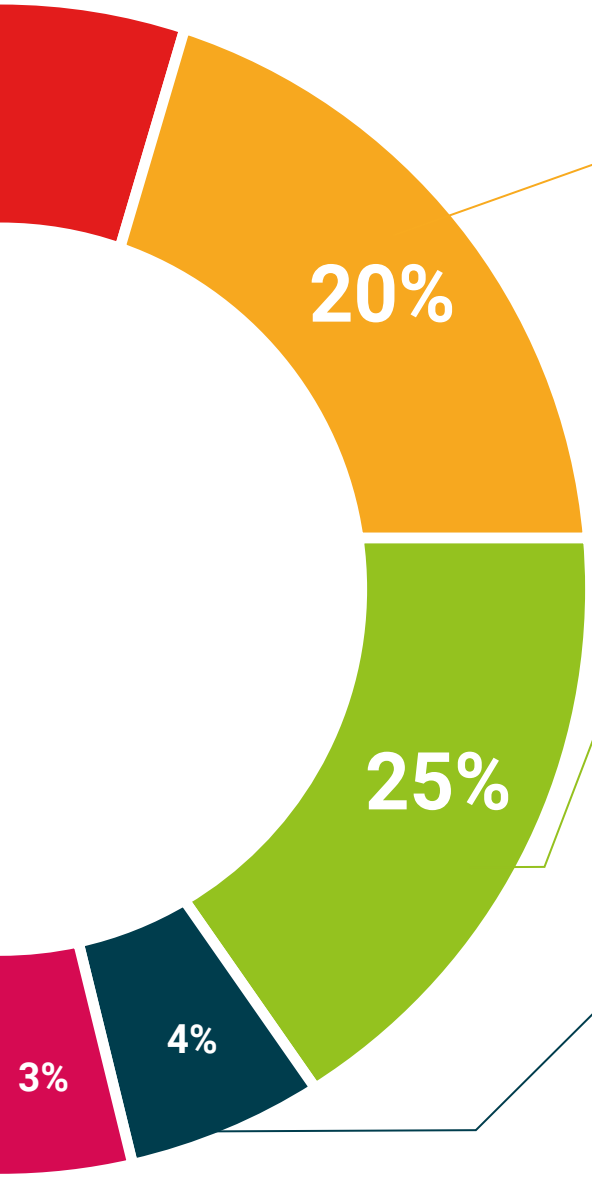
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.



Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

07

Certificate

The Professional Master's Degree in Renewable Energies guarantees you, in addition to the most rigorous and up-to-date training, access to a Professional Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork"

This program will allow you to obtain your **Professional Master's Degree diploma in Renewable Energies** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2002. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Renewable Energies**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**

tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Professional Master's Degree in Renewable Energies

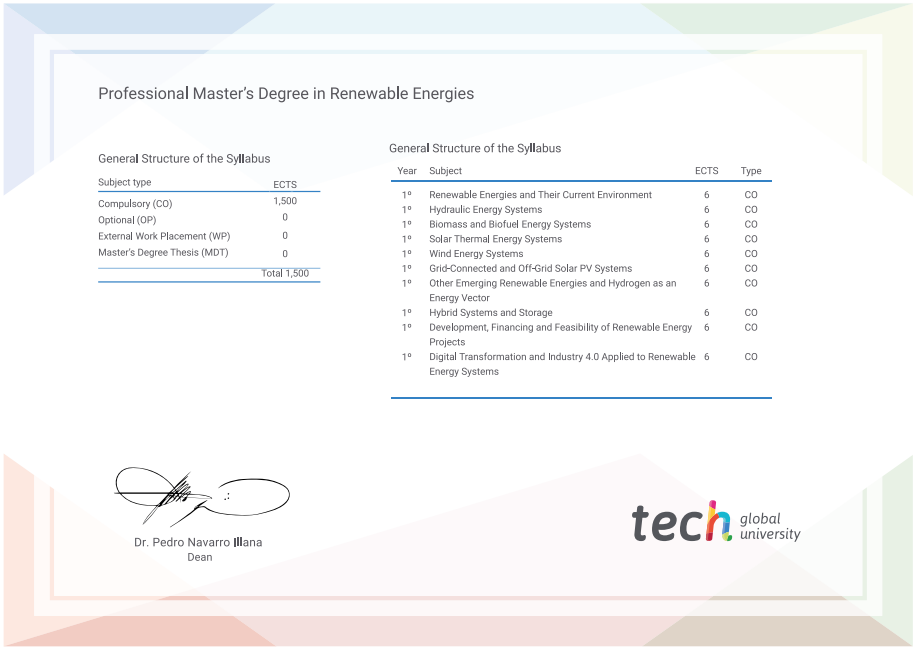
This is a program of 1,500 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates



Professional Master's Degree in Renewable Energies

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	1,500
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 1,500

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Renewable Energies and Their Current Environment	6	CO
1º	Hydraulic Energy Systems	6	CO
1º	Biomass and Biofuel Energy Systems	6	CO
1º	Solar Thermal Energy Systems	6	CO
1º	Wind Energy Systems	6	CO
1º	Grid-Connected and Off-Grid Solar PV Systems	6	CO
1º	Other Emerging Renewable Energies and Hydrogen as an Energy Vector	6	CO
1º	Hybrid Systems and Storage	6	CO
1º	Development, Financing and Feasibility of Renewable Energy Projects	6	CO
1º	Digital Transformation and Industry 4.0 Applied to Renewable Energy Systems	6	CO

Dr. Pedro Navarro Illana
Dean

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Professional Master's Degree
Renewable Energies

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Renewable Energies

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