



GSS-VET

Geothermal and solar skills - Vocational education and training

VOCATIONAL EDUCATION AND TRAINING IN EUROPE THE GSS-VET PROJECT

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Funded by the
Erasmus+ Programme
of the European Union



Erasmus + Sector Skills Alliances
575891-EPP-1-2016- 1-EL-EPPKA2-SSA

About the Project



- All new buildings by 2020 will have to be nearly zero energy buildings (EU Directive 2010/31/EU, Energy Performance Buildings).
- Building practice shows, that most vocational education and training providers do not yet include green skills in their Curriculum.
- The project **GSS-VET** aims to tackle the existing skills gap in continuous training for plumbers and electricians concerning geothermal and solar skills by creating and implementing a demand-driven VET training.



About the Project

Aims



- Enhancing creativity and innovation incl. entrepreneurship at all level of VET.
- Promoting work-based learning incl. traineeships, apprenticeships and dual learning models to help transition from learning to work.
- Promoting partnership between public and private institutions.
- Reaching the objective of 15% of adults to participate in lifelong learning.
- Making lifelong learning and mobility a reality.



About the Project Outputs



- 2 EU core curricula for Geothermal and Solar energy systems installers (EQF level 4-5);
- Innovative teaching method;
- Complete training material available online (for trainees and trainers);
- On-line evaluation method;
- Certification of the training;
- Roadmap for the official recognition of the training by 2025;
- Network of VET providers implementing the GSS - VET training in different EU countries.



Project Preconsiderations



- Different Education, Qualifications and Classifications in Europe.
- Innovative Training Methods.
- Labour Market Situation.
- Training of Trainers.



About the Project Consortium



Greece

1. TEI of Crete (Project Coordinator)
2. Chania Development Corporation
3. European Center in Training for Employment
4. Hellenic Association of Photovoltaic Companies
5. SQLearn
6. TÜV Austria Hellas



Bulgaria

1. Chamber of Installation Specialists
2. European Labour Institute
3. Sofia Energy Centre
4. Technical University of Sofia



Germany

1. German Geothermal Association
2. Hochschule Bochum
3. International Geothermal Association



Spain

1. ALECOP
2. Instagi



About the IGA



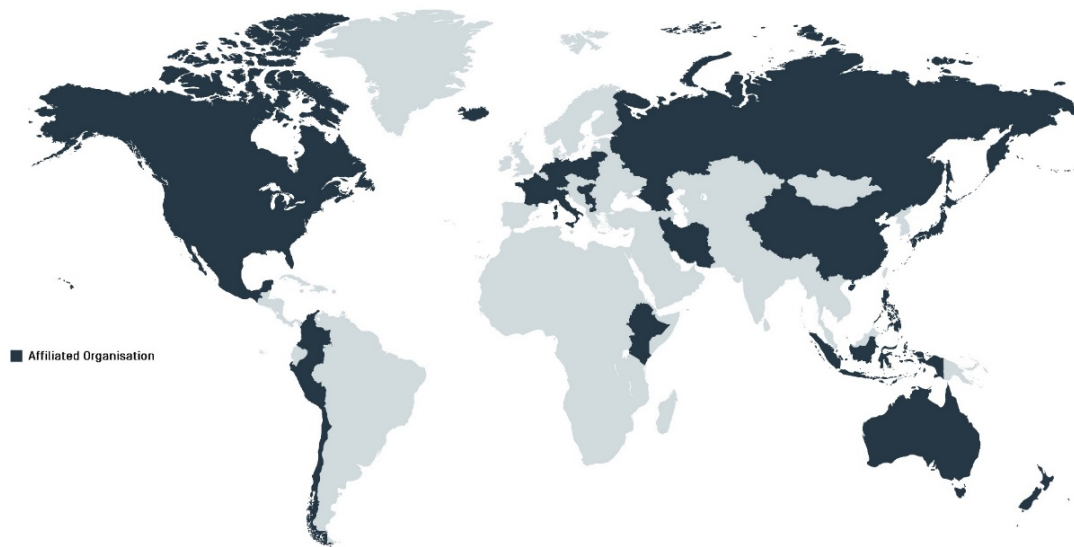
OUR MISSION

Encourage, facilitate and promote the development of geothermal resources, as well as innovative research in geothermal technologies.

OUR VISION

Future global energy needs can be based on a 100% renewable energy mix, and at the IGA we are committed to make geothermal energy a significant part of that.

OUR MEMBERS



30 Affiliated National Organizations
5,000 Members Worldwide
ranging from academy to industry representatives

OUR PARTNERS



Implementation

Implementation

PILOT TEST

200 workers
trained in pilot testing
40 teachers
in specialised training

...by 2025

TRAINING FOR
2500 workers

- Focus on technical skills, but also on transversal ones, including entrepreneurship, ICT, interdisciplinary skills and ability to work effectively with people from other disciplines.
- For the above an e-Learning Platform is to be designed with corresponding digitalized contents.

Training Programme

- GSS-VET foresees to produce an e-learning synchronous and asynchronous system – the GSS-VET Platform.
- The Platform being created, all training materials will be digitalized and uploaded online, in English, as well as Bulgarian, German and Greek.



GSS-VET
Geothermal and solar skills - Vocational education and training

Log in

Geothermal and solar skills-Vocational education and training

The strategy for the development of the EU, aims to transform it into a smart community through innovation technologies implementation, a low-carbon economy through RES involvement and an inclusive society with strong emphasis on job creation and poverty reduction.

Geothermal and solar energies are sectors that perfectly fit this context and for which new skills and competences are crucially important. This is the aim of GSS-VET - to create and offer adequate, advanced education and training on the geothermal and solar systems to be largely used in the building /green industry in 4 pilot and further on – in 8 more EU countries.

Training Programme

Block 1. Introduction to Solar Thermal Energy

- Unit 1.1: The Sun (Solar Energy)
- Unit 1.2: National Requirements
- Unit 1.3: Types of installations and components
- Unit 1.4: Measurement Systems
- Unit 1.5: Basic Configurations of Solar Thermal Installations

Block 2. Solar Thermal Installations for DHW and Space Heating in Single-family Houses

- Unit 2.1: The thermosyphon system
- Unit 2.2: The heat storage - Basic concepts
- Unit 2.3: The hydraulic system: pipes and the heat bearer fluid
- Unit 2.4: The solar collector and different anchoring types
- Unit 2.5: The auxiliary system
- Unit 2.6: The hydraulic circuit
- Unit 2.7: The regulation and control system
- Unit 2.8: Design and calculation of installations
- Unit 2.9: Prevention of occupational risks and safety work on the construction site
- Unit 2.10: Start up of solar thermal installations

Block 3. Solar Thermal Energy Systems for Buildings: Residential Multifamily and Commercial Buildings

- Unit 3.1: The Solar Collector Fields
- Unit 3.2: Types of Installations and Schemes
- Unit 3.3: Monitoring Plan and Preventive and Corrective Maintenance

Game

- Set up a Solar Water Heating (SWH) system

Self-assessment

- Self-assessment Quiz_Unit 1.1
- Self-assessment Quiz_Unit 1.2
- Self-assessment Quiz_Unit 1.3
- Self-assessment Quiz_Unit 1.4
- Self-assessment Quiz_Unit 1.5
- Self-assessment Quiz_Unit 2.1
- Self-assessment Quiz_Unit 2.2
- Self-assessment Quiz_Unit 2.3 + 2.4
- Self-assessment Quiz_Unit 3.1
- Self-assessment Quiz_Unit 3.2
- Self-assessment Quiz_Unit 3.3



Training Units

Menu

1. The regulation and control system
2. Unit objectives
3. Contents
4. Types and overview of solar controllers (1/15)
5. Temperature and flow sensors (1/9)
 - 5.1. Temperature and flow sensors (2/9)
 - 5.2. Temperature and flow sensors (3/9)
 - 5.3. Temperature and flow sensors (4/9)
 - 5.4. Temperature and flow sensors (5/9)
 - 5.5. Temperature and flow sensors (6/9)
 - 5.6. Temperature and flow sensors (7/9)
 - 5.7. Temperature and flow sensors (8/9)
 - 5.8. Temperature and flow sensors (9/9)
6. Methods of temperature regulation and control (1/15)
7. Conclusion
8. End of unit


Search...

2.7 The regulation and control system Exit

Temperature and flow sensors (2/9)

▶ Base theory of temperature sensing and types of sensors

- Negative Temperature Coefficient (NTC) thermistors



Solar Temperature Sensor Sas-10 Sb-10

Menu

1. The regulation and control system
2. Unit objectives
3. Contents
4. Types and overview of solar controllers (1/15)
5. Temperature and flow sensors (1/9)
6. Methods of temperature regulation and control (1/15)
 - 6.1. Methods of temperature regulation and control (2/15)
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 - 6.3. Methods of temperature regulation and control (4/15)
 - 6.4. Methods of temperature regulation and control (5/15)
 - 6.5. Methods of temperature regulation and control (6/15)
 - 6.6. Methods of temperature regulation and control (7/15)
 - 6.7. Methods of temperature regulation and control (8/15)
 - 6.8. Methods of temperature regulation and control (9/15)
 - 6.9. Methods of temperature regulation and control (10/15)

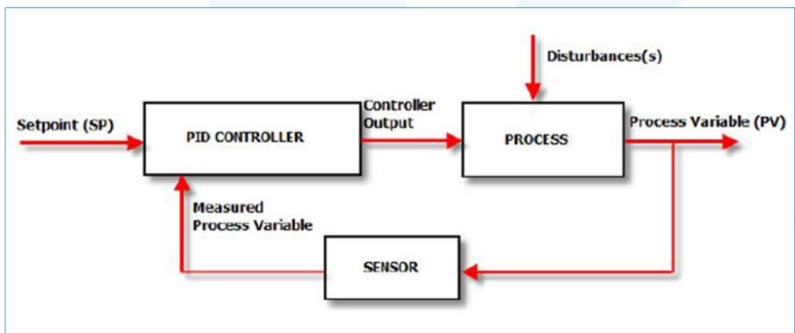
Search...

2.7 The regulation and control system Exit

Methods of temperature regulation and control (1/15)

▶ Methods of temperature regulation and control

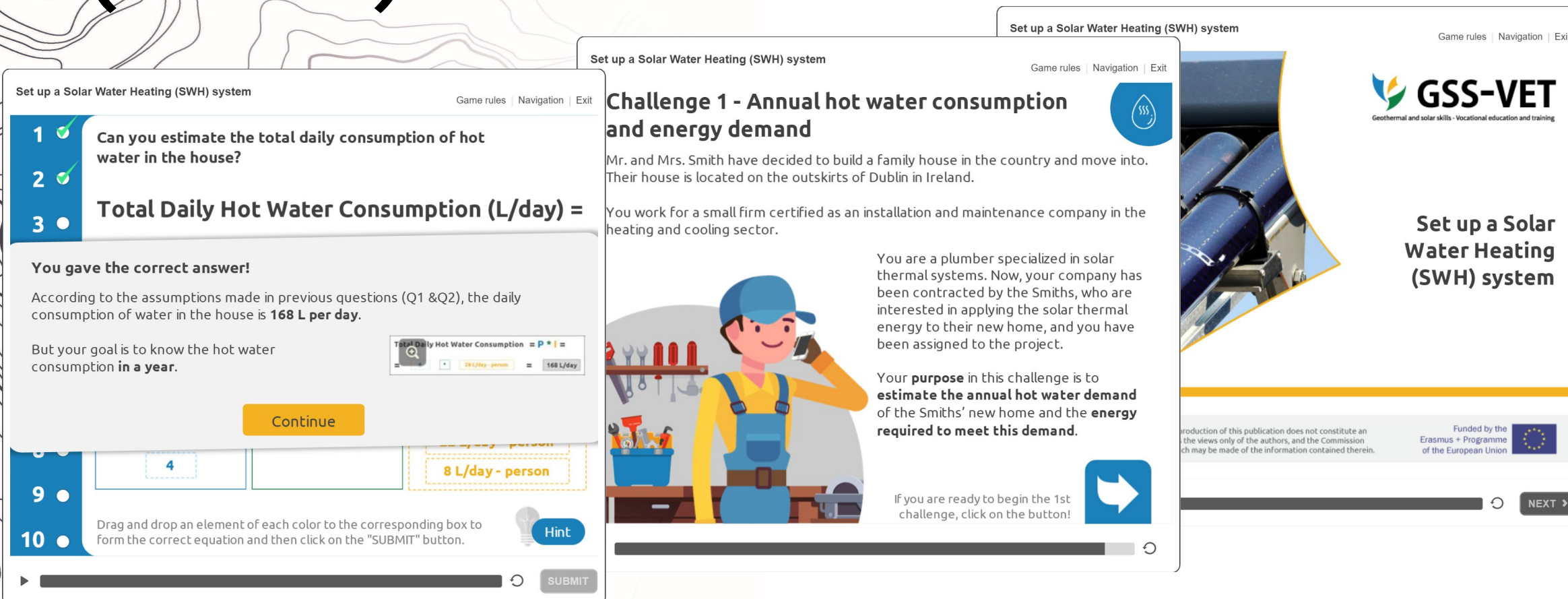
Block Diagram of a Process under Control System



```

    graph LR
      SP[Setpoint (SP)] --> PID[PID CONTROLLER]
      PID -- Controller Output --> PROC[PROCESS]
      PROC -- Process Variable (PV) --> PV[Process Variable (PV)]
      PV -- Measured Process Variable --> SEN[SENSOR]
      SEN --> PID
      DIST[Disturbances(s)] --> PROC
      
```

Self-assessment (Game)



The screenshot displays the game interface for 'Set up a Solar Water Heating (SWH) system'. It features a top navigation bar with 'Game rules | Navigation | Exit'. The main content area is divided into several sections:

- Challenge 1 - Annual hot water consumption and energy demand:** A blue header with a water drop icon. The text reads: 'Mr. and Mrs. Smith have decided to build a family house in the country and move into. Their house is located on the outskirts of Dublin in Ireland. You work for a small firm certified as an installation and maintenance company in the heating and cooling sector. You are a plumber specialized in solar thermal systems. Now, your company has been contracted by the Smiths, who are interested in applying the solar thermal energy to their new home, and you have been assigned to the project. Your purpose in this challenge is to estimate the annual hot water demand of the Smiths' new home and the energy required to meet this demand.' Below the text is an illustration of a plumber in a blue cap and yellow shirt talking on a mobile phone. A blue arrow button is at the bottom right of this section.
- Progress and Question 1:** A list of 10 questions. Questions 1 and 2 are marked with green checkmarks. Question 3 is the current question: 'Can you estimate the total daily consumption of hot water in the house?'. Below it, a feedback box says 'You gave the correct answer!' and 'According to the assumptions made in previous questions (Q1 &Q2), the daily consumption of water in the house is 168 L per day. But your goal is to know the hot water consumption in a year.' A calculator shows 'Total Daily Hot Water Consumption = P * 365 = 168 L/day'. A yellow 'Continue' button is below.
- Question 4:** A question box with '4' and '8 L/day - person'.
- Question 10:** A question box with '10' and 'Drag and drop an element of each color to the corresponding box to form the correct equation and then click on the "SUBMIT" button.' A 'Hint' button is next to it.

At the bottom right, there is a 'NEXT' button with a right arrow. A small disclaimer at the bottom left of the game interface reads: 'The production of this publication does not constitute an endorsement of the views only of the authors, and the Commission does not guarantee the accuracy of the information contained therein.' A funding logo for the Erasmus+ Programme of the European Union is also present.

Self-assessment (Test)

English (en) My courses This course Gregor

Dashboard My courses Solar Thermal Training Material Self-assessment Quiz_Unit 1.1


Quiz navigation

1 2 3 4 5 6
7 8 9 10 11
Finish attempt ...

Solar Thermal Installations

Question 1
Not yet answered
Marked out of 1.00
Flag question

A domestic solar water heating system classify properly as an:

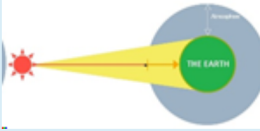


Select one:

- a. Application of solar thermal technologies at high temperature.
- b. Application of solar thermal technologies.
- c. Application of solar photovoltaic technologies.
- d. Application of passive solar energy technologies.

Question 2
Not yet answered
Marked out of 1.00
Flag question

The insolation of any "entry point" into earth's atmosphere 1 square meter sized over 1 hour is:



Select one:

- a. The solar constant.
- b. 1,367W/m2
- c. 1,367 kWh
- d. 1kWh.

Training Material Self-Assessment Quiz_Unit 1.3

Solar Thermal Installations

Question 1
Not yet answered
Marked out of 1.00
Flag question

Solar thermal technologies are based on

Select one:

- a. Passive heat collection
- b. Active heat collection
- c. Heat collection. Either passive or active
- d. Light collection

Question 2
Not yet answered
Marked out of 1.00
Flag question

All solar active thermal technologies use

Select one:

- a. Any liquid with acceptable heat transfer properties as the HTF
- b. Water or other liquids with heat transfer properties or air as the HTF
- c. Non potable water or glycol solution as the HTF
- d. Distilled water as the HTF

Question 3
Not yet answered
Marked out of 1.00
Flag question

Un glazed flat-plate solar collectors are used in

Select one:

- a. Medium temperature solar thermal systems and applications.
- b. Low temperature solar thermal systems and applications
- c. Medium to high solar thermal systems and applications
- d. High temperature solar thermal systems and applications

Question 4
Not yet answered
Marked out of 1.00
Flag question

Steam generation for industry processes and power generation use

Select one:

- a. Evacuated Tube solar collectors
- b. Glazed Flat-Plate solar collectors
- c. Un glazed Flat-Plate solar collectors
- d. Solar concentrators

Certification

- The examination mechanism will conform to the requirements of ISO/IEC 17024 and will follow the ECVET recommendations.
- Once certified by a national VET provider, the skills of the trainee will be recognized by the whole network of VET providers.

CERTIFICATE

As part of TÜV AUSTRIA HELLAS's system according to the requirements of the international standard ISO/IEC 17024, it is certified that Mr./Mrs.

XXXXXXXXXXXXXXXXXXXX

Date of birth: xxxx-xx-xx

Participated successfully in the relevant examination and demonstrated knowledge, skills and professional competencies in accordance with the requirements of the Professional Qualifications Standard for Geothermal Installers (PQS_Geothermal Installers_V1)

for

GEOHERMAL INSTALLERS



Geothermal and solar skills - Vocational education and training

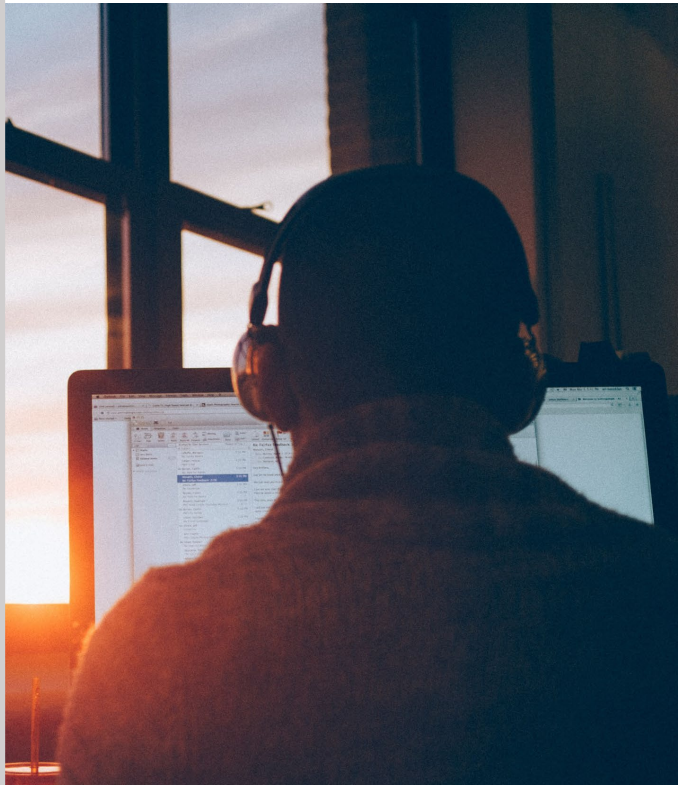
The holder of the Certificate shall be complied with the requirements of standard PQS_Geothermal Installers_V1.

Certificate Registration No.:	xxxxx
Initial Certification	xxxx-xx-xx
Valid until	xxxx-xx-xx
Persons' Certification Division	
Certification Body TÜV AUSTRIA HELLAS	Athens, xxxx-xx-xx

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Erasmus + Sector Skills Alliances
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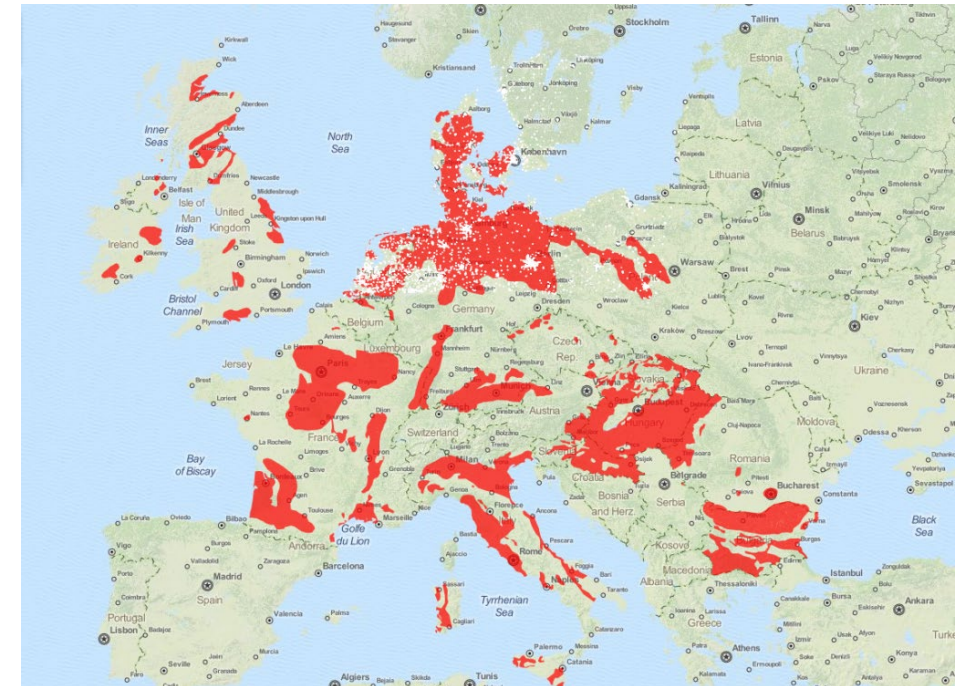
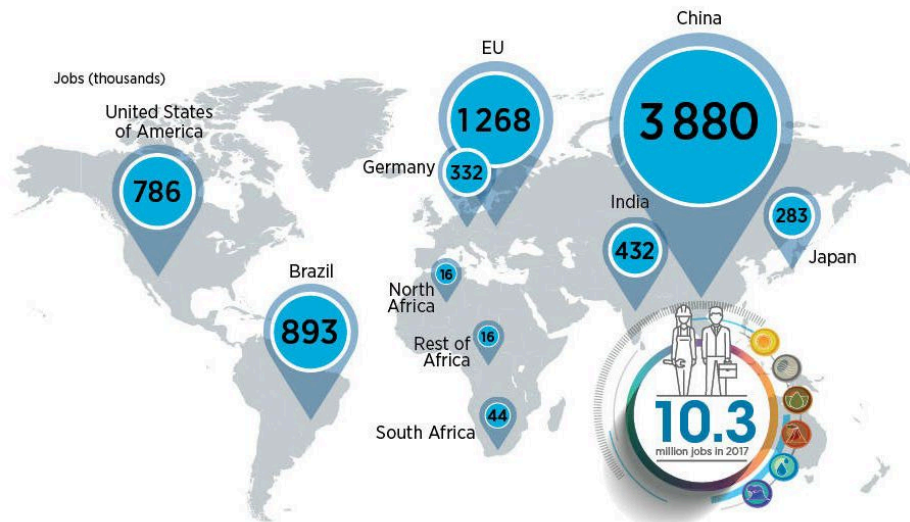
Experiences & Future Outlook



Renewable Energy and Jobs
Annual Review 2018



The renewable energy sector employs 10.3 million people, with most jobs in Asia.



Thermal demand and geothermal district heating potential in Europe





Thank you for your
attention.

