

User-Centred Energy Systems

userstcp.org



5 passi da INGEGNERA

A career guidance course for
upskilling energy related competences
and bringing STEM discipline closer.



www.italiainclassea.enea.it



BACKGROUND

- In 2023, the gender gap in STEM remains significant, with women making up only 28% of the STEM workforce.
- The presence of women in the field of energy efficiency and saving, especially as technicians and decision-makers, remains very low.
- Improving Gender Diversity in STEM is crucial.
- Gender diversity in the workplace has numerous benefits, including bringing new perspectives to STEM, filling gaps in a growing workforce with skilled workers.

The graphic features a header with logos for Ministero della Transizione Ecologica, Italian classeA, Donnein classeA, ENEA, Fondazione Maire, and le Con tempo rance. The main text reads '5 passi da INGEGNERA' in a stylized font, followed by 'webinar on April 17th at 3pm CEST Users TCP Academy'. A quote bubble contains the text: 'Boosting the number and diversity of energy professionals in the buildings sector'. The bottom illustration shows five diverse professionals walking across a green crosswalk in a city setting.

MINISTERO DELLA TRANSIZIONE ECOLOGICA

Italian classeA

Donnein classeA

ENEA

FONDAZIONE MAIRE

le Con tempo rance

5 passi da INGEGNERA

webinar

on April 17th at 3pm CEST

Users TCP Academy

“ Boosting the number and diversity of energy professionals in the buildings sector ”

BACKGROUND



- Involvement of the Italian Energy Efficiency Agency , member of EnR network, and link to the EU Green Deal

National Information and Training Programme for Energy Efficiency

A new national long-term EE program for information and training actions promoted by the Italian Ministry of Environment and Energy Security according to art.12 of 2020 Decree 73 (National transposition of EED).

Timeline: until to 2030

Budget: 9 million every three years

It is included in the National Recovery and Resilience Plan, part of the Next Generation EU (NGEU)



Italia in Classe A - some actions

Women in Classe A:

- design structural and non-episodic gender policies
- different narrative of STEM subjects that can reach the youngest generations (*5 Passi da Ingegnera*)
- training on financial issues linked to energy management
- new lexicon of energy technologies to reduce gender gap in the energy efficiency supply chain



Informational campaigns and target funding of qualification measures for professionals in energy market and build renovation sector



Including studies on skill needs and occupations in Information Campaigns on EE to attract young people and women

BACKGROUND

- **To reach** the 2030 objectives for **energy efficiency** a workforce equipped with the necessary **digital and green skills is urgently needed**.
- In Italy today many of these competences are still lacking, both among design professionals and construction and installation and building maintenance companies.
- The **Information and Training Programme** , among its goals, aims to support policy decision makers, companies, and professionals in the industry, as well as **VET (Vocational Education and Training)** providers, in taking the necessary steps to develop and formally recognise the digital and green skills required .



BACKGROUND

Transformation of energy system requires new skills

Key occupations and key skills in energy efficiency:

- ✓ Electrification, digitalization and automation
- ✓ Installation of new technologies and materials involves increasing number of crafts, excellent design, Planning skills, communication skills, digital and cross cutting skills.



The INIATIVE

"5 passi da Ingegnera" - 5 steps to engineering

- An Initiative targeting female high school students, providing a **career guidance course** focusing on energy-related STEM disciplines as well as broader workplace skills.
- A journey into the world of engineering and the energy transition that aims to outline a path of study and work that will be useful to tackle the new challenges of climate change.
- It aims to encourage secondary school students to pursue STEM subjects.



The INIATIVE

"5 passi da Ingegnera" - 5 steps to engineering

Partnership :The project was conceived with a public-private collaboration model. Enea, The Italian Agency for Energy Efficiency together with Fondazione Maire founded to promote the preservation and knowledge of the historical archival heritage of the MAIRE Tecnimont Group and foster the training of tomorrow's "humanist engineers" who will be able to apply their broad vision and multidisciplinary knowledge to contribute to the energy and digital transition. The course is carried out within Italy in Class A *programme* and taught by energy professionals and researchers.



BACK GROUND

The initiative is recognized by a specific *programme* appointed by the Ministry of Education that welcomes young students in the fourth year of high school, for whom it created alternating school-work programs focused on developing in the school system a teaching approach oriented on developing the skills needed for employment.

The **school-work alternation**, mandatory for all students in the last three years of high school, is one of the most significant innovations of Law 107 of 2015 (La Buona Scuola) in line with the principles of inclusive school.





Press release, March 2024

The second edition of the "5 Steps as an Engineer" project comes to an end. It has been a journey of discovery into the world of engineering and energy transition, which has involved 22 fourth-year students from five high schools in Rome and its province - Aristotle, Farnesina, Montale, Giulio Verne, and Argan.

Fondazione MAIRE hosted the awarding ceremony in the presence of the Chairman of the MAIRE Group and Foundation, Fabrizio Di Amato, and the Director of the ENEA National Agency for Energy Efficiency, Ilaria Bertini.

This already important moment opened in connection with the European Parliament where the event "Women empowerment and enterprise" was underway, with Vice President Pina Picierno, for a mutual greeting and presentation of our experiences.



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Goals

- Support the energy transition with inclusive measures and embracing the objectives of the 2030 Agenda, specifically Goal 5, dedicated to gender equality.
- Show new opportunities within the green economy for youngest generation.
- Design, production and promotion of concepts and communication channels designed to reduce the gender gap in the energy efficiency supply chain;
- Participate in national events for the dissemination of activities and results
- Encourage similar initiatives of educational and vocational guidance.



Secondary Schools in Rome

- liceo scientifico statale Farnesina ed il liceo artistico C.G.Argan della prima edizione,
- liceo linguistico Montale,
- liceo scientifico Aristotele
- Istituto tecnico Giulio Verne.
- First edition 2022-2023 n. 5 students
- Second edition 2023-2024 n. 23 students
- <https://www.youtube.com/watch?v=GCDwyiDK8B8>
- Third edition scheduled for 2024-2025

The Training Journey

Contents:

- 45- Experts from MAIRE group and ENEA researchers were involved in the training journey as teachers.
- Reinforce pillar skills for STEM approach (**critical thinking, communication, collaboration, creativity**)
- Digital transformation;
- energy efficiency in traditional industrial processes;
- energy efficiency in civil construction;
- energy efficiency and green technologies;
- energy efficiency and behaviour change;
- Citizen energy communities;
- New materials:** production of recycled plastics, bioplastics and biofuels;
- communication tools for energy efficiency;



The course's features

- ⦿ 80 (eighty) hours
- ⦿ 10 (ten) days
- ⦿ Participation in National Events
- ⦿ Participation in Career Days and University Campus
- ⦿ <https://italiainclassea.enea.it/simultane/digital-storytelling/digital-storytelling/28/tag/24>



The **5 steps to Engineering** students at the University Campus at la Sapienza in Rome , an initiative to attract female students to the world of research, work, and to technology-related activities with Prof. **Romano Prodi**, Past President EU Parliament e **Anna Kaisa Itkonen**, Member of Cabinet of Kadri Simson, EU Commissioner for Energy

DIGITAL LIBRARY FEATURING STORIES OF ENERGY PROFESSIONALS AND ENGINEERS

Digital storytelling

Behind these inspirational stories, and the achievements of many women in engineering across the country, lies a disturbing truth that explains why **raising awareness of female engineers' achievements** is needed.

Engineering remains one of the least gender diverse professions with an unacceptably slow rate of improvement.

[Italia in Classe A \(enea.it\)](http://enea.it)



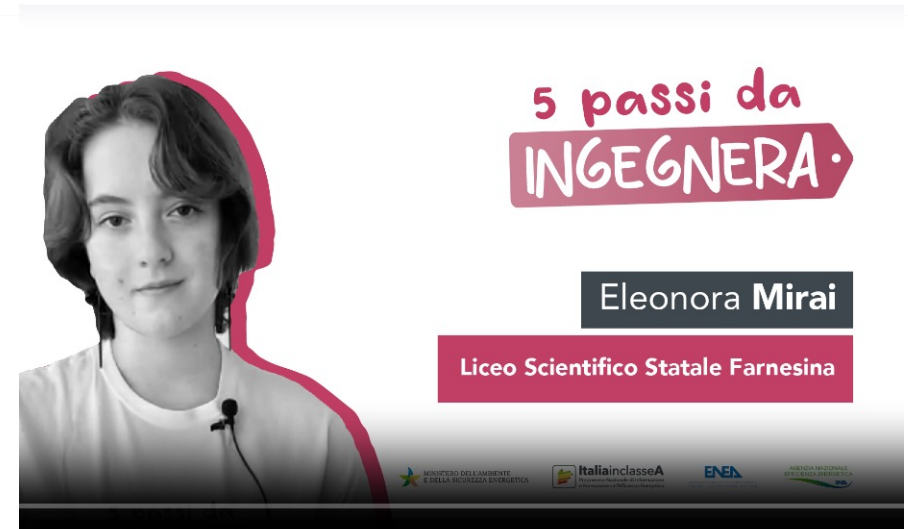
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DIGITAL CONTENT TARGETED TO TEEN AGERS

Digital storytelling

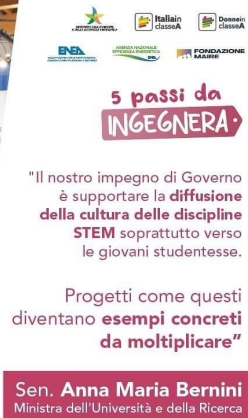
“Engineers shape our world. They design and build the physical infrastructure that sculpts our cities, homes and transport networks. They create digital products and services that power our lives, including the communication tools that we have relied on so heavily during the pandemic. They mediate the benefits of advances in biomedical science so that new vaccine technology can result in vaccines manufactured at scale and delivered safely to the healthcare workers who administer them.

Engineers will be crucial to tackling every global challenge of our age, from climate change to cybersecurity.”



[Industry expert explains why we need more female engineers](#)
[| World Economic Forum \(weforum.org\)](#)

Dissemination activities



5 passi da Ingegnera at **Didacta Fair Italy**, the most important event on innovation for schools, as it aims to promote the debate on the world of education among institutions, associations and companies, in order to create a meeting place with teachers and headmasters.

Florence, Italy

Ministry of Education
MIUR



- ⊙ Career day at University La Sapienza Rome
- ⊙ The students meet Simona Ventura, a famous Italian TV presenter who joined the Career day and the girls with Ilaria Sergi, Enea Project leader

keywords

**#empowerment #sustainability #stem #greenjob #skill
#softskill #leadership#inclusiveenergytransition**



Thanks for your attention
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Tackling the lack of skilled workers in the buildings sector – the Swiss way

The Swiss education campaign for the buildings sector

Barbara Schäfli

Swiss Federal Office of Energy, Programm SwissEnergy

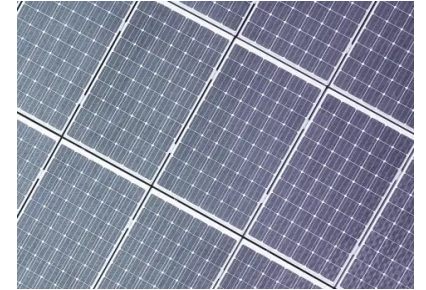
17.4.2024



Importance of the buildings sector

Buildings are responsible for around 33% of CO2 emissions in Switzerland

- **Implementation of renewable heating systems**
→ Replacement of 32'000 fossil-fuel-based heating systems annually until 2050.
- **1 million houses in urgent need of renovation**
→ A renovated building envelope requires up to 60% less heating energy.
- **Expansion of PV**
→ 700 MW of photovoltaic capacity to be added each year.



Challenges and outlook for buildings sector occupations

- Crisis-proof!
- Exciting work!
- Worthwhile, future-orientated work!

Shortage of skilled workers could be obstacle to meeting energy and climate goals!

The construction sector will soon be short of tens of thousands of skilled workers

The construction sector will soon be short of tens of thousands of skilled workers due to a wave of retirements. The number of new apprentices has also fallen for more than a third in recent years .

«Higher wages and part-time work»: construction companies are having to fight for skilled labour

The Swiss construction sector is short of young talent. Companies now have to attract skilled labour with higher wages and flexible part-time positions

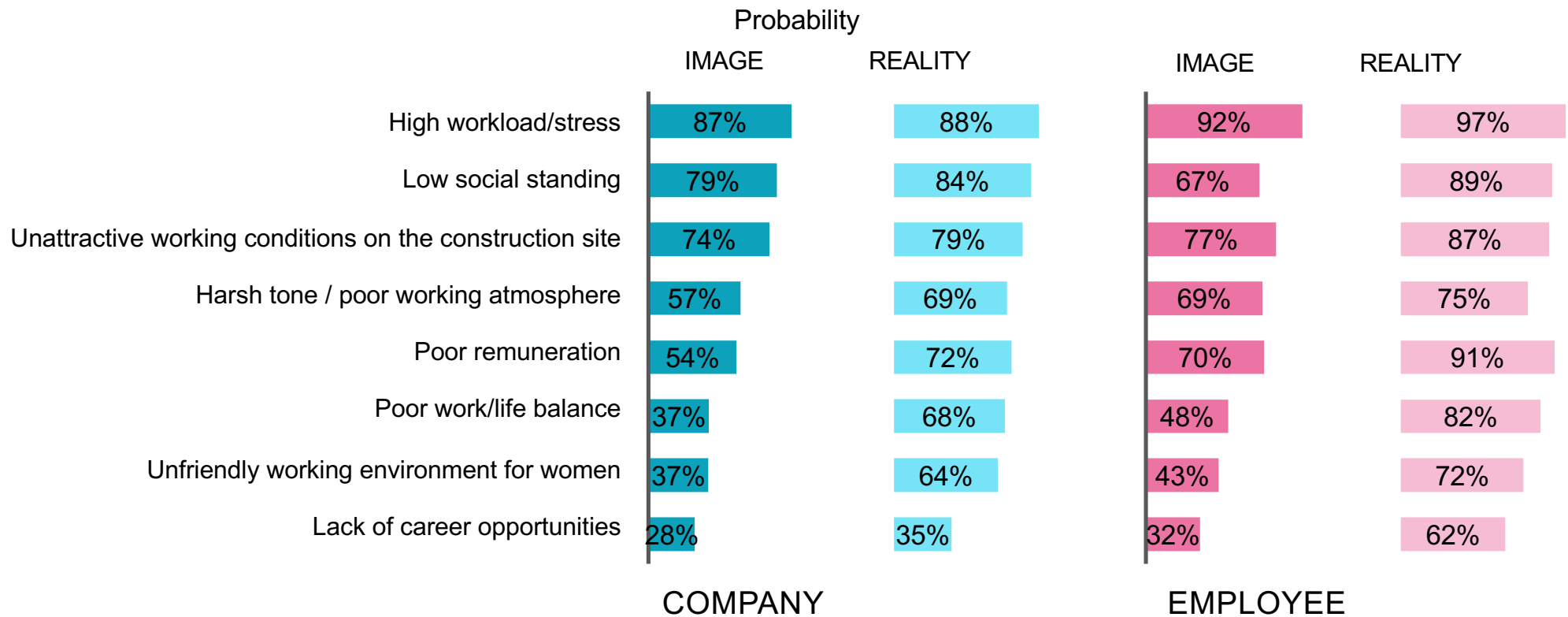
Source: blick.ch, 2020

Source: nau.ch, 2022



- Average
- 80% of the adverts are online for at least X days (20% quantile)
- 20% of the adverts are online for at least X days (80% quantile)

Image of the buildings sector

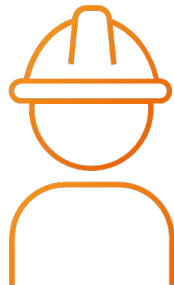
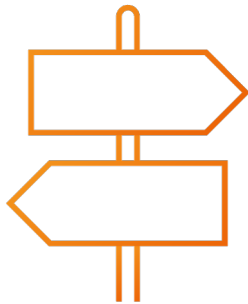


According to surveys PRECONCEPTIONS are often confirmed in REALITY

Education campaign for the buildings sector

Goals

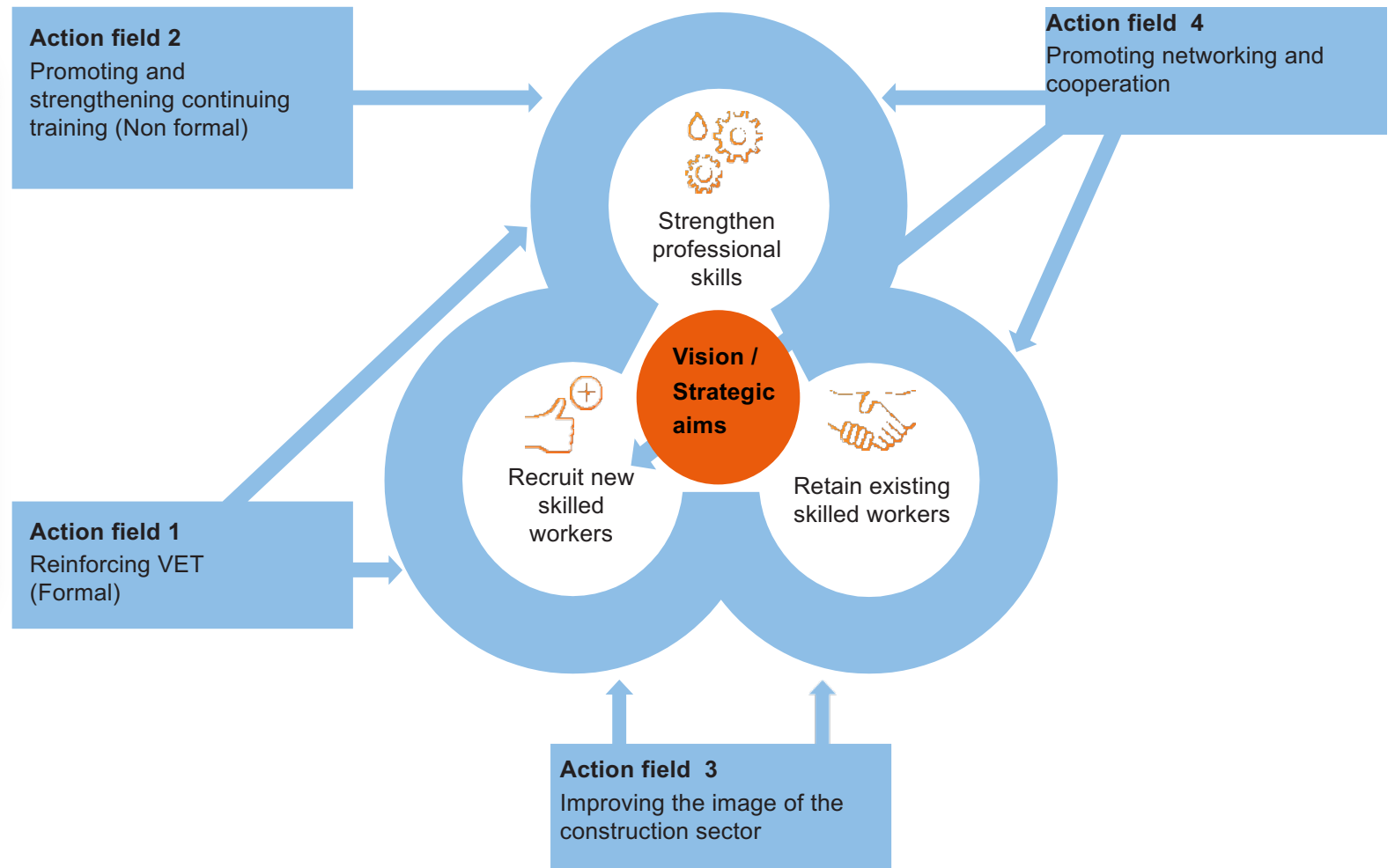
- Ensuring the necessary skilled labour in the buildings sector for the timely construction and conversion of buildings to meet the net-zero target
- Strengthening technological and energy and climate skills to ensure the quality of work



Result - Roadmap for Buildings education campaign: 3 goals and 4 fields of action



<https://pubdb.bfe.admin.ch/de/publication/download/10780>



Fields of action and 11 focal points

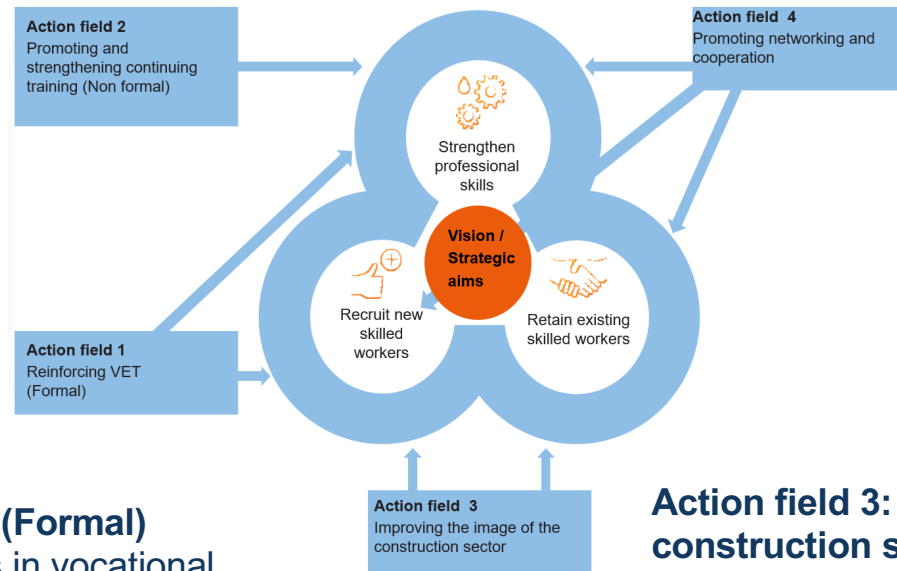
Action field 2 - Continuing training (Non-Formal)

- 2A. Strengthening professional skills through continuing training
- 2B. Encouraging participation in continuing education and training
- 2C. Strengthening the skills of trainers

Action field 4: Networking and cooperation

- 4A Strengthening cooperation within the sector

Many measures already supported by Swiss Energy



Joint efforts by the sector must be consolidated -> Concept for joint activities

Action field 1 – Reinforcing VET (Formal)

- 1A. Ensuring the professional skills in vocational education and training
- 1B. Encouraging apprentices
- 1C. Promoting vocational retraining and lateral entry

Action field 3: Improving image of the construction sector

- 3A Improving working conditions
- 3B Enhancing the image of the buildings sector
- 3C Promoting interest in careers in the field of construction
- 3D Promoting women

Education campaign for the buildings sector

Continuing education
and training

Vocational education
and training

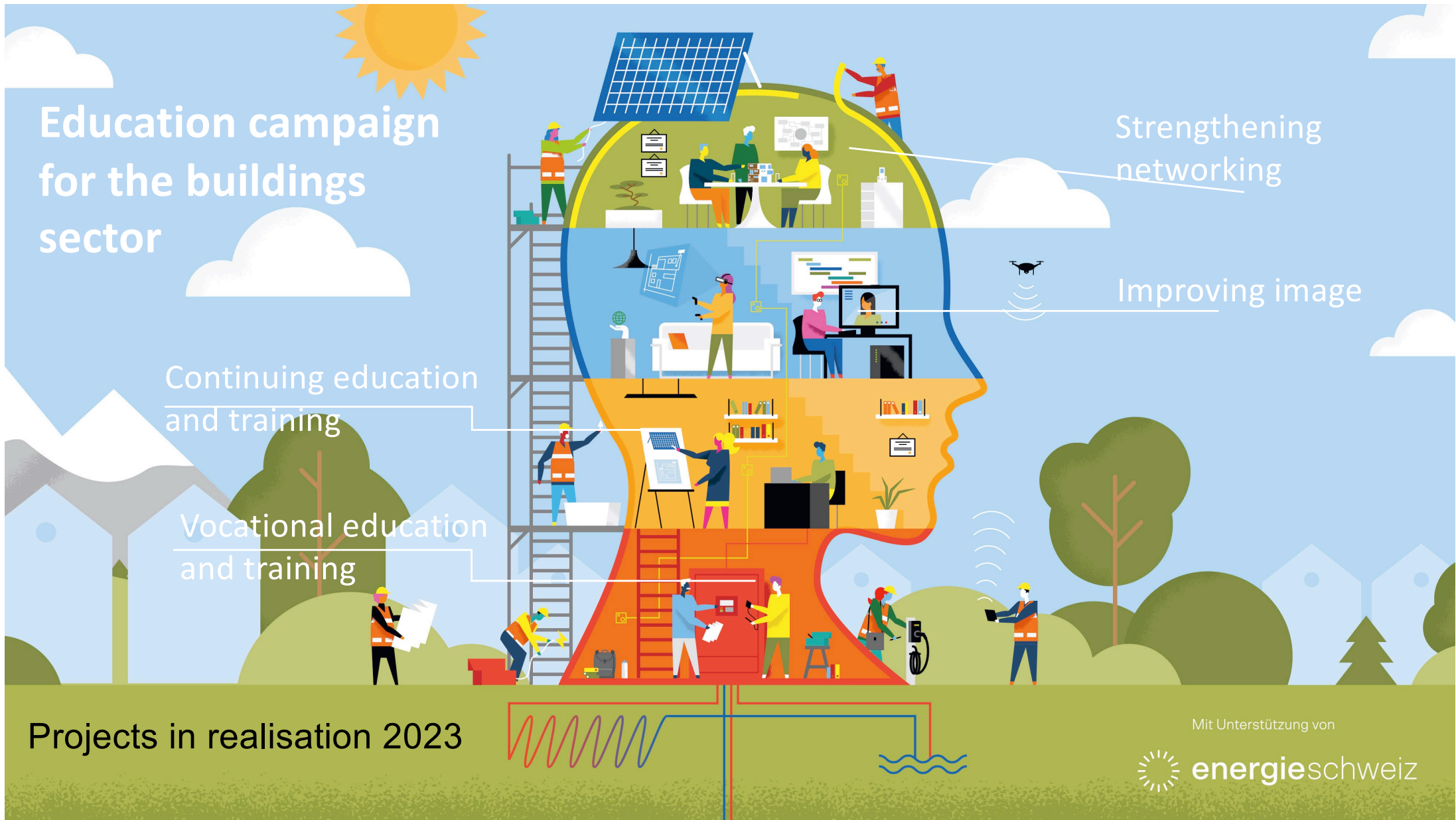
Strengthening
networking

Improving image

Projects in realisation 2023

Mit Unterstützung von

 energieschweiz





Proactive Projects by Swiss Energy

- Study on need for skilled labour for replacement heating systems, PV and renovation measures
- Development of an impact model, monitoring tool with baseline data, sector survey
- Series of articles
- Support point for stakeholders for project submissions.
- National networking conference and several workshops on various specialist topics
- Needs analysis of career-orientated continuing education and training courses for associations in the buildings sector to acquire environmental and energy-related skills: Identifying gaps, synergies, opportunities for cooperation



VET

AF 1 – Strengthening formal education and training

- Swissolar: Development of two new apprenticeships/new basic training programmes «Solar Installer» and its marketing
- Suissetec: 1:1 Realisation of training facilities for sectoral training programme on solar panel installation
- Various associations: Learning media platform for the new training programme «Building Envelope Planner»
- University of applied sciences Berne: Implementation of sustainability in the degree programme for architecture
- Architectural Council of Switzerland: Round tables for universities to foster exchange on sustainable construction and strengthen sustainability in all Swiss architecture degree programmes



CET

AF 2 – Strengthening skills through non-formal education and training

- Solafrica: Refugees go solar - CET conversion programme for **refugees**
- Modell F/Swissolar: Basic conversion programme for **unemployed lateral entrants** to solar installation. Mixed courses for people already working in the sector and unemployed.
- GebäudeklimaSchweiz: Conversion course to heat pump specialist
- FWS: CET courses and experience exchanges on heat pumps, PV and electromobility
- Swissolar and Suissetec: CET courses on PV
- Eit.Swiss: CET various courses in the field of energy (e.g. Electromobility, PV, etc.)
- SIA InForm: CET programme on climate-friendly construction
- SUPSI: Analysis of the need for short CET courses on energy-related issues in the real estate sector



Improving image

AF 3 – Improving attractiveness and image and encouraging interest in construction occupations

- BauenSchweiz/KGTV: Preparing realisation of a concept for a joint “image campaign” for the entire building sector
- Oekozentrum/Suissetec: Climate-Energy challenge day for secondary level II - schools to raise awareness of careers in the construction sector among young people
- SVK: Material for careers advice and careers fairs in the field of refrigeration technology



Strengthening networking

AF 4 – Strengthening cooperation within the sector

- 1st National Networking Conference in 2023
- Targeted promotion of cooperation projects through financial support
- Organisation of round tables to harness synergies in CET of various occupational fields into the construction sector
- Ensuring continual dialogue between solar education stakeholders

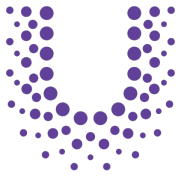
Takeaways

- The buildings sector is key to achieving energy and climate policy goals
- The buildings sector has an excellent outlook for the future
- Joint efforts and measures are more effective and increase the visibility of the sector
- The necessary measures have been identified
- The sector must be perceived to be attractive by young people and those who influence them
- Image campaigns can only be sustainable if the promises they make are kept
- Companies, especially small ones, must be picked up along the way
- The federal government can only initiate steps and offer support, but the measures must be taken by the sector itself

Further information

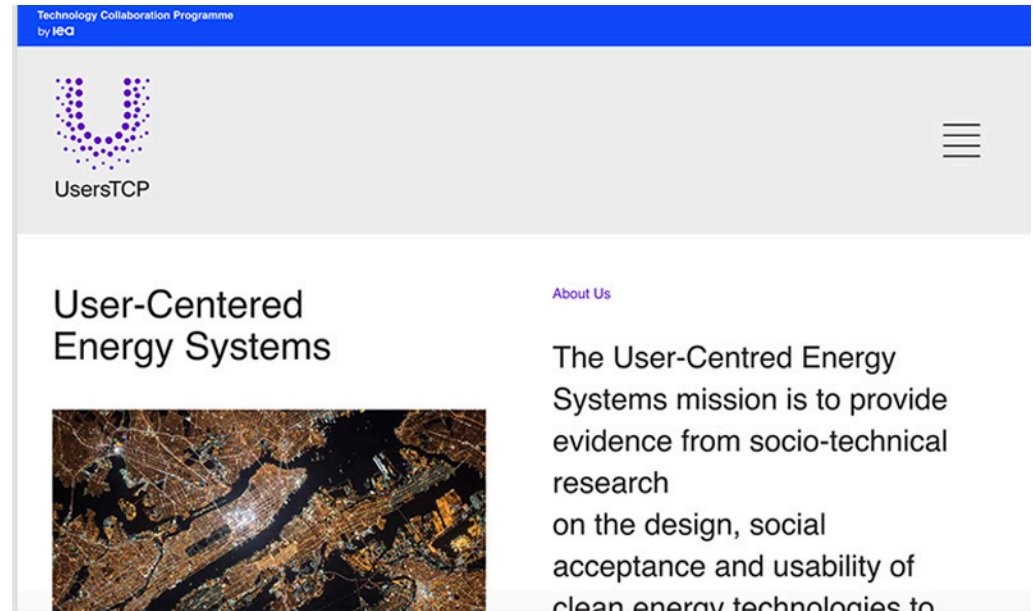
Information in German, French and Italian
www.energieschweiz.ch/bildung/

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User-Centred
Energy Systems
Academy



Social
License to
Automate



Public Engagement
for Energy
Infrastructure



Peer-to-
Peer Energy
Trading



CampaignXchange



Hard-to-
Reach Energy
Users



Behavioural
Insights
Platform



Gender
and
Energy