



# Research and advanced services: where and how



## THE TECHNOLOGICAL INNOVATION ATLAS

The tool for understanding what we do and who does what: new technologies, advanced products and services are described in over 500 technical sheets constantly updated. Jointly with a short introduction of the activities, advantages and possible uses, the sheets list the contacts of the research groups that developed them. The Atlas can be directly accessed from the ENEA Home Page and the items of interest searched by free text entry, or by entering the NACE code of economic activities, or the Technological Cluster.

Contact us at: [eneaperlinnovazione@enea.it](mailto:eneaperlinnovazione@enea.it)

## THE TRANSFER OF KNOW-HOW

We transfer technological know-how to SMEs and Industries, promote new high-tech enterprises and provide training courses, jointly with Universities and professional associations.

Contact us at:  
[trasferimentotecnologico@enea.it](mailto:trasferimentotecnologico@enea.it) - for joint projects with enterprises  
[brevetti@enea.it](mailto:brevetti@enea.it) / [spinoff@enea.it](mailto:spinoff@enea.it) - for patents and spin-off  
[een@enea.it](mailto:een@enea.it) - for support, audits and consulting services to encourage business innovation

## MAKING ENERGY EFFICIENCY POSSIBLE

Fiscal incentives, White Certificates, the Thermal Bill, good practices at home, at school and at the workplace, energy diagnosis and legal regulations: we can tell you what to do, show you the technologies, the good practices and the legal obligations companies, PA and citizens have to comply with.

Contact us at : [segreteria.utee@enea.it](mailto:segreteria.utee@enea.it)

[www.enea.it](http://www.enea.it)



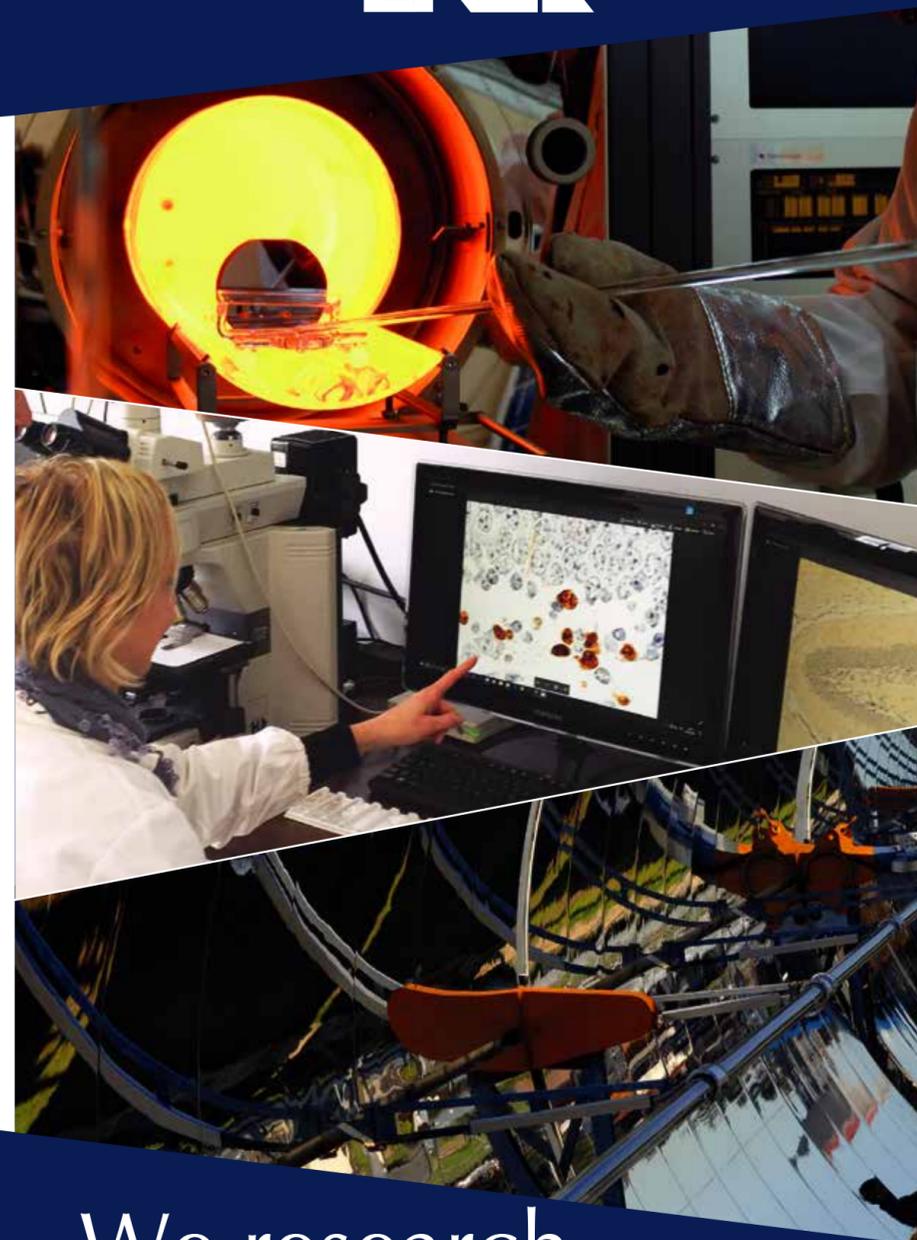
*“ Responsible research and innovation, the process of aligning research and innovation to the values, needs and expectations of society”*

Carlos Moedas

European Commissioner for Research, Science and Innovation



Italian National Agency for new technologies, energy and sustainable economic development



# mission

“ENEA is a public body with the aim of pursuing research and technological innovation, as well as providing enterprises, public administration and citizens with advanced services in the sectors of energy, the environment and sustainable economic development.”

Law no. 22 of 28<sup>th</sup> December 2015

## WHAT WE MEAN BY RESEARCH

Our centers and laboratories host over 2400 staff employees, including researchers, technologists and administrative personnel. A wealth of expertise, increasingly growing and valorized through collaborations with enterprises and other national and international research institutes; we provide Public Administration with technical support and promote awareness-raising on energy and the environment all over the national territory by disseminating scientific knowledge to the benefit of public at large.

To us, research reaches beyond the lab into civil society.

Technological innovation for sustainable development and energy efficiency is in our DNA. From climate change to smart cities, from protection of cultural heritage to sustainable tourism and to international cooperation activities: wherever innovation and research are needed, right there is where we want to be. We revamped our organization with the purpose of becoming ever more coordinated, efficient and easily reachable. The new organizational structure, adopted since 1st July 2015, is divided into four Research Departments: Territorial and Production Systems Sustainability, Energy Technologies, Fusion and Technology for Nuclear Safety and Security and the Energy Efficiency Technical Unit.

# Our



# We research innovation

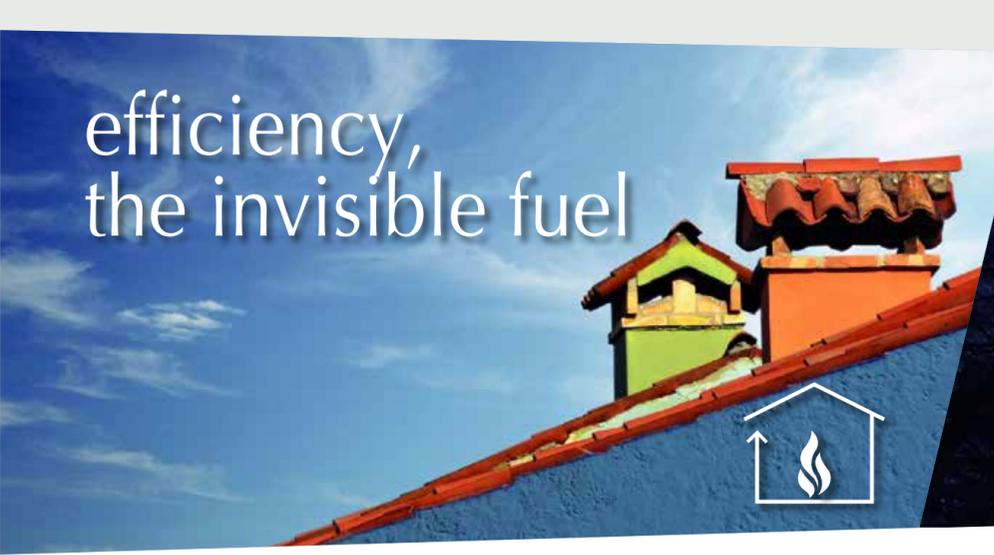
Italian National Agency for new technologies, energy and sustainable economic development



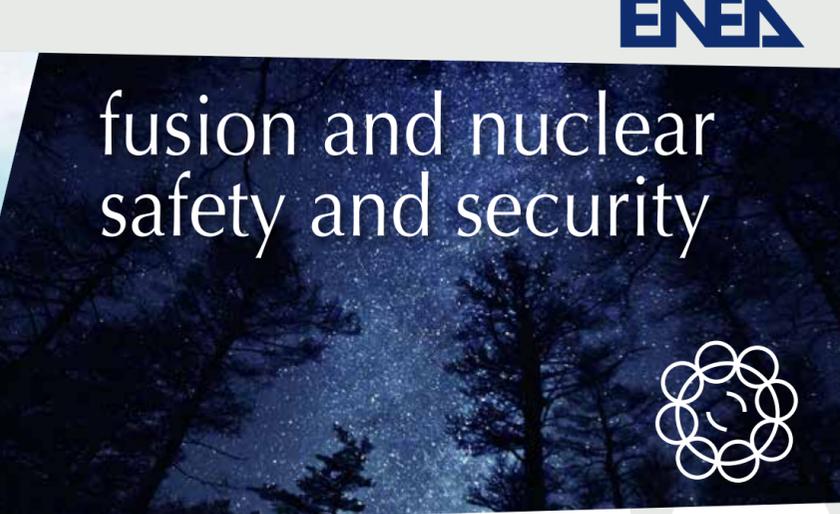
sustainability



energy technologies



efficiency,  
the invisible fuel



fusion and nuclear  
safety and security



Research for future generations



The pathway to a low-carbon economy calls for an efficient use of energy and a deep transformation of industrial production and consumption models.

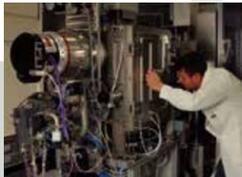
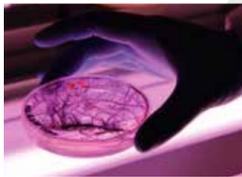
Technological innovation plays a crucial role in this process, and we do research to integrate innovation with sustainable development.

It's a challenge demanding an inter-sectoral and multi-disciplinary approach. From the study and monitoring of the environment and climate to the definition of strategies for reducing greenhouse gases; from the development of technologies for recycling and reusing waste materials to nanomaterials; from seismic engineering to the study of biodiversity; from biotechnologies for agro-industry to biomedical technologies; our objective is the valorisation of the economic, natural and social resources of our Country.

Sustainable production cycles ensure competitiveness of enterprises on global markets, prevent depletion of ecosystems, promote new professional skills and quality employment. To this aim, we work in collaboration with SMEs, industry and PA; to us, research should yield sustainable results, providing society and enterprises with tools for growing, protecting the environment and landscape while fostering people's well-being.

### Sustainability of Production and Territorial Systems

- Efficient Use of Resources and Closure of Cycles
- Models and Technologies for the Reduction of Anthropic Impacts and Natural Hazards
- Protection and Enhancement of the Territory and Human Capital
- Biotechnology and Agro-Industry
- Technologies and Methodologies for Health Protection



Value-added energy



Experience has taught us that the energy issue requires the adoption of a systemic and global approach. Energy demand can be effectively met only through a mix of different energy sources and technologies.

All of them, fossil fuels and renewables, can be further improved to create a safe, clean and efficient energy mix to achieve the transition from a carbon-intensive to low-carbon economy, with reduced greenhouse gas emissions. This is the challenge that the EU has posed to the scientific community, and this is how we see it:

**Clean energy** means primarily cutting greenhouse gas emissions, because we share the target limit of global warming to 2°C. We also want to turn other polluting waste substances from energy cycles into resources and reuse them in the same energy cycles.

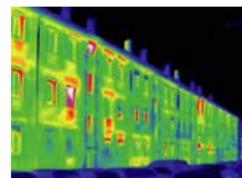
**Safe energy** means safety of plants but also resilience of energy infrastructures to catastrophic events and functionality constant over time; it also means ensuring a stable supply of energy to our Country in such a conflictual and difficult global political context as the one we are current living in.

**Efficient production** means optimizing the use of energy and natural resources we already have: It is our objective but also a means, since energy efficiency can reduce the costs of raw materials paid by companies, energy costs, the bill everybody pays –citizens, the PA and companies- but mostly environmental costs, which the whole society and future generations will pay unless we make radical changes.

### Energy Technologies

- Smart Energy
- Production, Conversion and Efficient use of Energy
- Photovoltaics and Smart Devices
- Solar Thermal, Solar Thermodynamic and Smart Network
- Development of Information and ICT Systems
- Bioenergy, Biorefinery and Green Chemistry

Beyond the Lab



Energy efficiency can be valued in the fuel saved, the pollution not emitted, briefly the social well-being it creates. It is beneficial to the environment, it can be implemented in all sectors, and can always be improved.

It is crucial to the national and European energy strategy, a fundamental tool for ensuring development and competitiveness and, at same time, proper management of natural resources, so necessary to economic growth.

The Energy Efficiency Technical Unit has a clear-cut goal and a broad scope of action: improving the efficiency of final energy uses in Italy.

Our stakeholders are all the productive sectors, the PA and citizens of our Country.

Therefore we not only do technology transfer, but also disseminate information, deliver training courses and conduct communication and awareness-raising campaigns; we have developed tools and procedures for implementing energy efficiency projects with public-private partnerships; we collaborate with the Ministry of Economic Development and the Regions for the implementation of the EU directives on energy saving, monitoring their results and impacts on the Italian economic and energy systems.

Energy efficiency can be improved only if people's behaviour changes along. Our job is providing you with the information on what to do, the technologies, the good practices, the fiscal incentives and the legal obligations.

### Energy Efficiency

- Digital Applications for Energy Efficiency in Public Administration
- Energy Efficiency in Economic Sectors
- Energy Efficiency Policies Monitoring
- Energy Efficiency in Urban Building Development
- Energy Efficiency Programmatic Activities
- Integrated Services for Territorial Development

A boundless energy



With our fifty-year experience on nuclear fusion and the broad involvement of the Italian industry, we represent our Country to the European Consortium for the development of fusion energy, EUROfusion.

EUROfusion manages the European fusion research activities of ITER, the world's largest scientific experiment undertaken by the European Union, a project to which the world aspires and contributes. ITER is expected to produce 10 times the energy invested to trigger the fusion reaction, an achievement which requires complex scientific and technological problems to be addressed and which can be reached only through a large international collaboration project.

Nuclear fusion is the process that powers the sun and the stars. In order to replicate this process on earth, we need to confine a plasma so that it achieves temperatures far higher than the stars, i.e. over 100 million degrees. Contrary to fission reactors, which in the event of an accident can trigger uncontrolled reactions, a broken down fusion reactor would immediately cool down and the nuclear reaction stop. That's why a controlled fusion reaction is safe for human health and the environment and, other major advantage, it does not produce CO<sub>2</sub> emissions heavily affecting global climate.

Nuclear fusion is high-level research with great industrial spin-offs. We have reached levels of excellence in producing experimental facilities and components, and have also addressed and found new applications to quite issues: from robotics and cultural heritage diagnostics to technologies for safety and prevention of terrorist attacks.

### Fusion and Technology for Nuclear Safety

- Nuclear Fusion Technologies
- Experimental Engineering
- Technologies, Plants and Materials for Nuclear Fission
- Safety and Sustainability of Nuclear Energy
- Physics Technologies for Health and Safety