

Side event of **“Our Common Future under Climate Change” - Paris 2015**

“A dialogue for developing synergies for sustainable energy production: how can biomass, hydrogen and carbon dioxide capture and storage work together to mitigate climate change”

Saturday June 20, 9:30 -13:30 - Palazzo Farnese in Caprarola (Viterbo) - Italy

Powerpoint presentations are available at this link:

<http://www.ceri.uniroma1.it/cn/index.do?id=162&page=88>

video: <https://www.youtube.com/watch?v=zcYBbro8Rj8>

The side event related to "Our common future under climate change" that took place in the Tuscia area has been a real success. The scientific workshop stimulated a large number of citizens (about 80) on a subject that is still too often considered "niche". It was held during “The Energy Festival”, organised by the EC-funded R&Dialogue project, which involves ten European countries. This project is looking for the most effective way, in each culture, to communicate between organizations and citizens on the development of energy strategies. (www.rndialogue.eu)



“Our common future under climate change” – Caprarola 20th June

The event was co-organized by **Sapienza University of Rome** (CERI Research Centre, Department of Earth Sciences, Department of Civil, construction and environmental engineering – DICEA); **ENEA** – Italian National Agency for New Technologies, Energy and Sustainable Economic Development; **CO₂GeoNet** – The European Network of Excellence for the Geological Storage of CO₂; **The Municipality of Caprarola**, with the participation of the **Italian Federation for Rational Energy Use - FIRE**; **University of Genova**; **UniRoma3**; **Energy Museum**; **Consumers' Movement**; **Society for Humanistic Coaching**; **Serendipity Association**; **Amici della Terra Italia Onlus**, **ASSOCARBONI**, **Italian Sustainable Aviation Fuel Forum**, **ISAF**.

The workshop focused on the potential for evidence-based solutions to climate change challenge and science-society dialogue. The event offered to the interested parties, in particular local policy makers, environmental science students and the public at large, an up-to-date introduction to three technologies: biomass, hydrogen and carbon dioxide capture and storage (CCS), whose synergic development looks very promising in terms of CO₂ emissions reduction, while at the same time supporting sustainable development and affordable energy for all.

It was also an opportunity for stakeholders in the energy field to meet and interact directly with public at large and discussing how these three technologies mentioned above, can work together to tackle the climate change challenge.

After a warm welcome by the Mayor of Caprarola, **Eugenio Stelliferi**, the workshop was introduced by Samuela Vercelli, Researcher of Sapienza University of Rome and coordinator of R&Dialogue activities in Italy .



Samuela Vercelli talked about the the importance of societal dialogue between the research community and citizens to promote the development and application of technological innovation in the energy field and to help people get acquainted with the new technologies which can help us reduce emissions and mitigate climate change.

Samuela Vercelli, Researcher of Sapienza University of Rome and Eugenio Stelliferi, Major of Caprarola (Viterbo)



Vito Pignatelli – Head of the Laboratory “Biomass and Biotechnology for Energy” of the Energy Technologies Department at ENEA, and Chairman of ITABIA, Italian Biomass Association – spoke about the importance of biomass as a widely available source of renewable energy and the economic and environmental sustainability of a bioenergy project which can even become carbon negative when associated to CCS.

Bioenergy means a set of different technologies that allow to produce not only renewable energy, but also raw materials for the so-called “green chemistry” from biomass. Therefore, bioenergy can provide an important contribution to supply future energy demand, especially in rural areas, as biomass is the most important among the renewable energy sources in the world and it has a significant potential for growth both as regards the production of electricity and heat, as well as - in the form of liquid or gaseous fuels, known as “biofuels” - in the transport sector.

Angelo Moreno, Responsible for Hydrogen and Fuel Cell management at ENEA, described the role of hydrogen and fuel cells in the decarbonisation of the energy system and how important this energy vector can be in boosting the potential of renewables. He highlighted the hydrogen as an energy vector both for transport and stationary applications. He described that different countries of the world have put hydrogen and fuel cells amongst the drivers of their economy, discussing how this technology will eventually enter into the everyday life of Italian citizens, in transport - moving toward full electric vehicles; in the energy sector transforming citizens from consumers to “prosumers”.

The presentation, by Professor **Salvatore Lombardi** - Sapienza University of Rome who, with his research group at Sapienza University of Rome, was the pioneer for scientific research on CO₂ storage technologies, highlighted that CCS has the potential to greatly reduce greenhouse gas (GHG) emissions in the short to medium term. Lombardi described the process that involves the capture of man-made CO₂ from large point sources, such as power plants or heavy industry plants, followed by its injection into porous rocks deep underground for permanent storage. He illustrated the scientific basis for CO₂ geological storage, the importance of CCS in the world and the feasibility of geological storage of CO₂ by describing examples like the Weyburn in Canada and Sleipner in Norway. He spoke about the safety of CCS and the interesting development in association with biomass and other renewables.

Maurizio Ferretti, University of Genova, explained that the increase of anthropogenic CO₂ concentration in the Earth's atmosphere has been linked to global warming which in turn has driven international efforts to explore mitigation strategies to CO₂ emissions. Carbon sequestration by mineral carbonation appears to be a realistic option for the capture and storage of CO₂. These reactions are part of a natural process of alteration and can be applied in situ or ex situ. The carbonation process can start from solid industrial wastes and its products can either be reused, for instance in construction, or be disposed of. Mineral carbonation can be considered as a stable, permanent and harmless solution for CO₂ storage.

After the presentations the break-out groups addressed various questions, which were subsequently shared in a plenary session by a representative of each group, among them:

- The challenge for the lay citizen to get a clear picture of the issues related to climate change and anthropogenic emissions of CO₂, also related to the often too technical communication on these topics
- Energy governance and the role of local communities in relationship to the global situation
- Emission trading schemes, which are mostly unknown to citizens
- The central role of citizens and the interaction between their choices, political decision and the need of more awareness about the energy options through education and training



Participant illustrated the group discussion

- The possible role of the town of Caprarola in implementing innovative technologies
- A discussion on energy as a commodity or a service, while with reference to self-production it could be considered a commodity, with regard to more centralised production big investments are required
- Renewables and development of the territory: small plants were felt as more apt for environmental protection and democratic development
- More information free from the influence of vested interests was seen as a fundamental step for more conscious decision making
- Importance of long term planning. Citizens should understand they can play an important role in orienting political choices
- The experience of countries that are more advanced could help the less advanced ones to shorten the time to reduce emissions

In the wonderful setting of Palazzo Farnese, some partners of R&Dialogue Italy (Consumers' Movement, Energy Museum, Sapienza University of Rome, the Italian Association of Chemical Engineering (AIDIC) in collaboration with ISAF, Society of Humanistic Coaching, Italian federation for Rational Energy use – FIRE) also set up exhibitions to meet citizens and submit their ideas, products, information materials in order to answer their questions.

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R&Dialogue's Italian members displayed information materials and answered questions from citizens.