

10 Dicembre 2021



Il futuro dell'energia: un'analisi dagli stakeholders internazionali

Prof. Massimo Santarelli (Politecnico di Torino)
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CONTEXT: Energy Transition



RENEWABLE ENERGY
PRODUCTION and STORAGE



CO₂ MITIGATION (and RE-UTILIZATION)
SOLUTIONS



ELECTRIFICATION
of end uses

complemented by



HYDROGEN
value chain



CIRCULAR ECONOMY PROTOCOLS

Energy transition: why? The main driving forces (examples in EU)

ITALY EXTREME RAINFALL. 29" IN 12 HRS ,
NEW EU RERD, OCT. 4, 2021.



COSTAL EROSION ON THE NORFOLK
COAST, ENGLAND. JAN. 27, 2021



SNOWSTORM FILOMENA. MADRID, SP.,
HEAVIEST STORM IN 50 YRS., JAN. 11, 2021



Energy transition: why? The main driving forces (examples in US)

LANDSLIDE IN CA ON OCT. 25, 2021.
"BOMB CYCLONE" & "ATMOSPHERIC RIVERS"



HURRICANE IDA: GOLF COAST AUG 30, 2021



POLAR VORTEX CAUSED EXTREME COLD :
SOUTH AS TX. FEB 15, 2021



SEA LEVELS RISE: NORTHERN SHORE, B.C.,
OCT. 13, 2021



Energy transition: why? and Valle d'Aosta Alps?



Ghiacciaio del Breuil Meridionale (La Thuile)

EU Policies targets to 2030 (Fit for 55) and PNRR

Il Green Deal della Ue: in cosa consiste il piano

Nome del piano

Fit For 55

Direttive

Azzerare le emissioni di CO2 nette entro il 2050



Stop

alla vendita di auto a benzina e diesel dal 2035



Ricarica elettrica:

una colonnina ogni

60km



Carbon tax

sull'import di prodotti inquinanti



Settori dell'Industria e dell'energia: taglio di emissioni del

61%



Energia:

il **40%** da rinnovabili entro il 2030



COMPONENTI E RISORSE (MILIARDI DI EURO):



59,47

Totale

M2C1 - ECONOMIA CIRCOLARE E AGRICOLTURA SOSTENIBILE 5,27

M2C2 - ENERGIA RINNOVABILE, IDROGENO, RETE E MOBILITÀ SOSTENIBILE 23,78

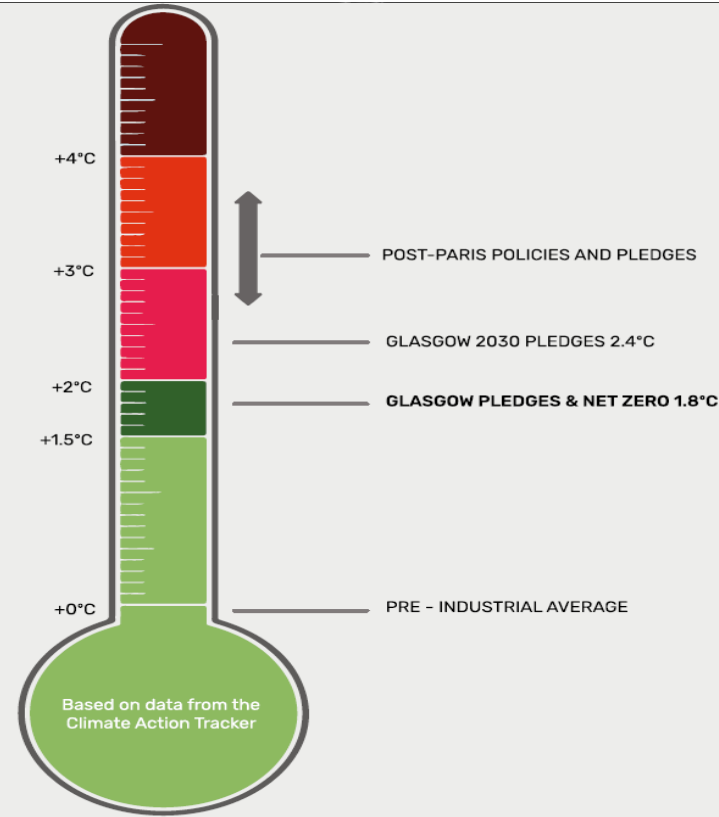
M2C3 - EFFICIENZA ENERGETICA E RIQUALIFICAZIONE DEGLI EDIFICI 15,36

M2C4 - TUTELA DEL TERRITORIO E DELLA RISORSA IDRICA 15,06

GLASGOW HAS KEPT 1.5°C IN REACH BUT FURTHER ACTION NEEDED

Ahead of Paris, some scientists said that there was a chance that temperatures could ultimately rise by up to 6°C. The pledges made under the Paris Agreement had the world on track to a 2.7-3.7°C rise.

If the pledges made at Glasgow are fully implemented, warming will be kept below 2°C; and with the commitment to further action over the next decade we have kept 1.5°C in reach.



COP26: THE GLASGOW CLIMATE PACT



Energy transition: not only problems ... opportunities as well

Opportunities across the entire value chain

Earnings growth opportunities will emerge across four different areas:

1
Clean energy generation

2
Transmission and distribution

3
Energy storage

4
Electric transport infrastructure



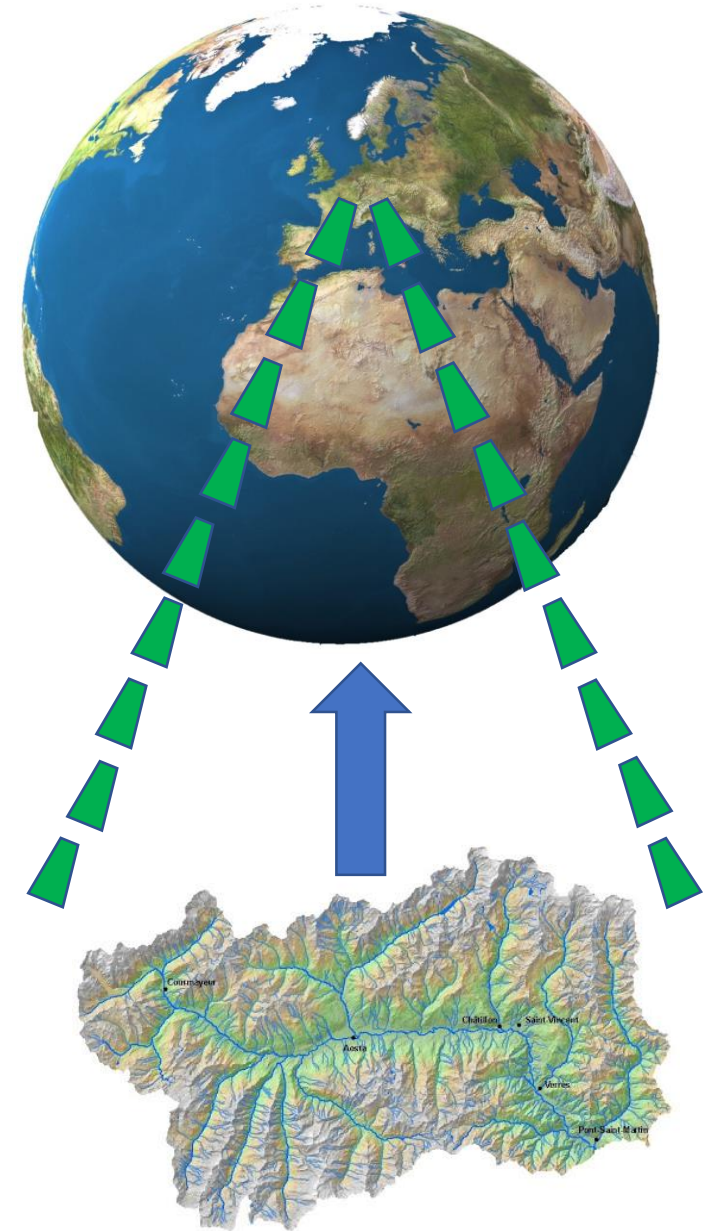
Fondazione Courmayeur: 3 years plan

The progressive **paradigm shift** offers the opportunity to **rethink the development models of sensitive territories such as the Alpine valleys**, which could virtuously link the vocation to environmental preservation with the new business models generated by the transition underway.

In fact, these regions have a **greater availability of renewable sources**, which represent the sustainable energy input of a series of new processes, and an **intrinsic sensitivity to sustainability issues**.

If these characteristics meet with **scientific and technological in-depth study**, the engine of creative innovation, this **science-territory union** can generally lead to **innovative scenarios** that bring benefits to the territorial ecosystem in two directions:

- in terms of **sustainability of local processes**
- above all, in terms of **development and formalization of new value chains** (processes and related enabling technologies) that can be implemented locally, but also exported beyond regional borders.



The future of energy: an analysis by international stakeholders

As a natural evolution of the Spring 2021 event, more centered on state-of-the-art picture in Valle d'Aosta, the today online seminar broadens the gaze to the opposite extreme of polarity:

the situation and development trends at an international level

This global vision aims to discuss and highlight the **macro-trends of the energy transition at the international level**, as an element of the global context on which to base future discussions at the local level.

In addition to the **analysis of international energy analysts (morning)**, the workshop also includes a **session dedicated to companies, national and international (afternoon)**, in order to focus attention also on the concrete policies of industrial stakeholders, as a vision of energy / environmental sustainability integrated by considerations of business opportunities and economic sustainability.

Event December 10th, 2021: agenda (morning)

9.00 a.m. Opening Session

Lodovico Passerin d'Entrèves President of the Scientific Committee, Fondazione Courmayeur Mont Blanc

Erik Lavevaz President, Regione Autonoma Valle d'Aosta

9.15 a.m. Introduction

Massimo Santarelli Scientific Coordinator of the Seminar, Full Professor, Department of Energy, Politecnico di Torino, Scientific Coordinator of CO2 Circle Lab

9.30 a.m. SESSION I

Energy transition: the international vision

Chair

Massimo Santarelli

Stefano Raimondi Director Division VI New Technologies and Research in the Energy sector, MITE - Ministero dello Sviluppo Economico



MINISTERO DELLA
TRANSIZIONE ECOLOGICA

Uwe Remme Head of Hydrogen and Alternative Fuels Unit, IEA - International Energy Agency

Ulrike Lehr Head of Socio-economic Unit, IRENA - International Renewable Energy Agency

Jack Brouwer Director NFCRC - National Fuel Cell Research Center; Director APEP - Advanced Power and Energy Program; Professor, Samueli School of Engineering, University of California, Irvine, U.S.

12.30 a.m. Question & answer session

Event December 10th, 2021: agenda (afternoon)

2 p.m.

SESSION II

The vision of Companies

Chair

Massimo Santarelli

Nicola Rossi Head of Innovation Policies, ENEL
Green Power

Pierre-Emmanuel Hickel Head of Innovation, TOTAL
Energies

Riccardo E. Bernabei Head of Origination &
Project Delivery, Hydrogen BU, SNAM

Marco Cantamessa President C.V.A. S.p.A -
Compagnia Valdostana delle Acque - Compagnie
valdôtaine des Eaux

5 p.m.

Question & answer session

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