



The IEMAP platform: the role of open and shared data

C. Ronchetti, S. Ferlito, M. Puccini,
S. Giusepponi, F. Buonocore, M. Celino, G. Ponti

ENEA – TERIN – ICT

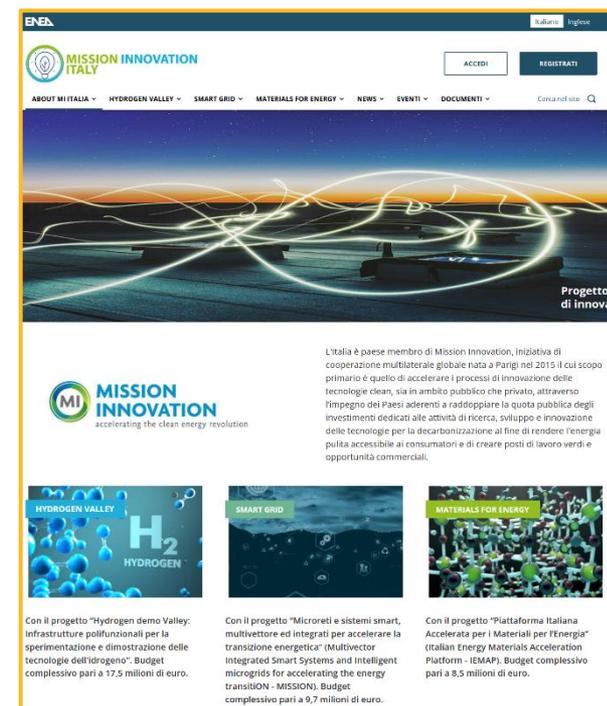
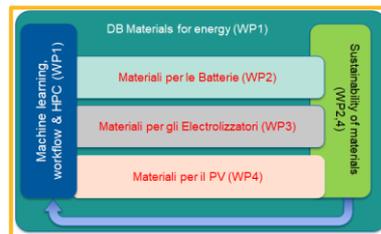
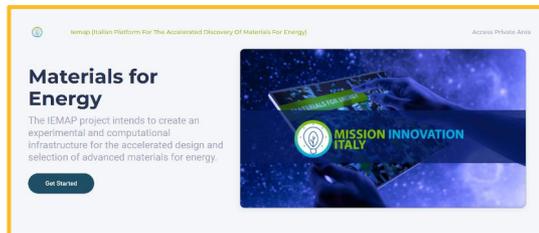


Mission Innovation Project

Mission Innovation

Italy is a member country of Mission Innovation, a global multilateral cooperation initiative born in Paris in 2015 whose primary purpose is to accelerate the innovation processes of clean technologies, both in the public and private sectors, through the commitment of member countries to double the public share of investments dedicated to research, development and innovation activities of decarbonization technologies in order to make clean energy accessible to consumers and to create green jobs and business opportunities

- **Smart Grid: MISSION - Multivector Integrated Smart Systems and Intelligent microgrids for accelerating the energy transition;**
- **Hydrogen: Hydrogen demo Valley** - Multifunctional infrastructures for the experimentation and demonstration of hydrogen technologies;
- **Materials for Energy: IEMAP - Italian Energy Materials Acceleration Platform.**
 - **Materials for electrochemical storage;**
 - **Materials for electrolyzers;**
 - **Materials for photovoltaics.**



Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

Metadata – FAIR



Data management

FAIR Principles

- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable

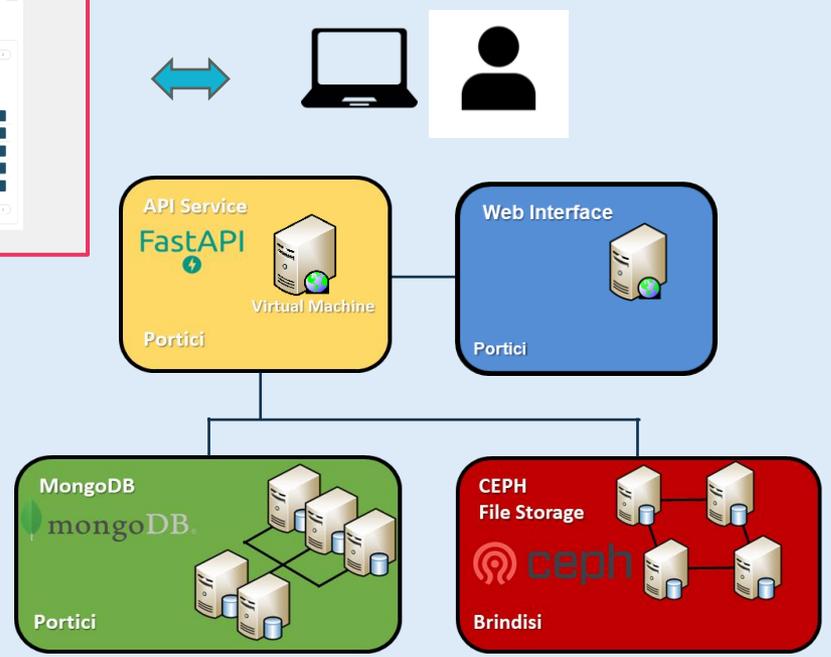
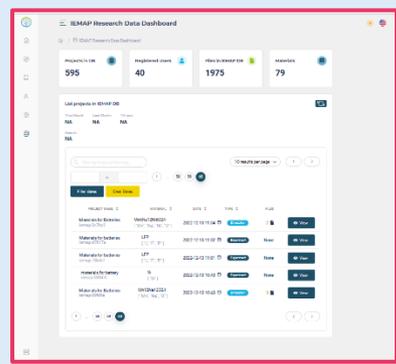




IEMAP Infrastructure

Italian Energy Materials Acceleration Platform

- ❑ **Web Interface**
 - ❑ Frontend
- ❑ **API Service**
 - ❑ Backend
- ❑ **CEPH**
 - ❑ File storage
 - ❑ 4 nodes (110 TeraByte)
- ❑ **MongoDB**
 - ❑ Database to store the metadata
 - ❑ 3 nodes (100 TeraByte)



Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

Use Case



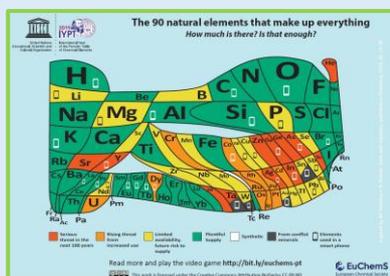
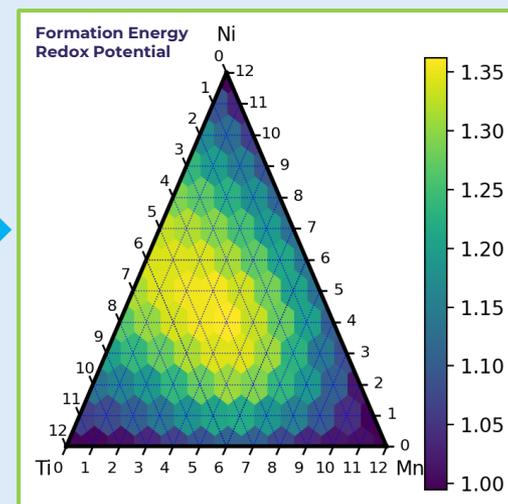
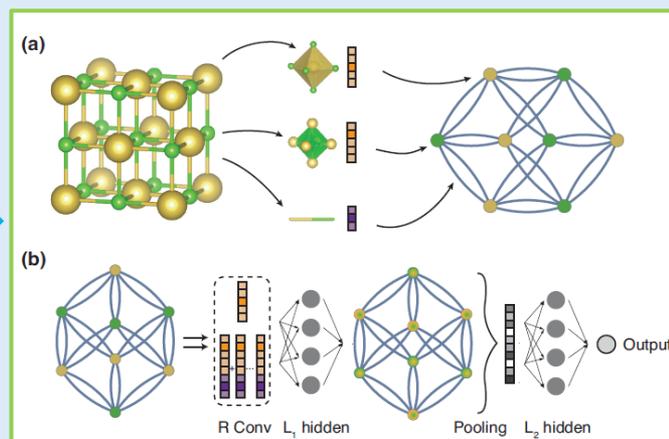
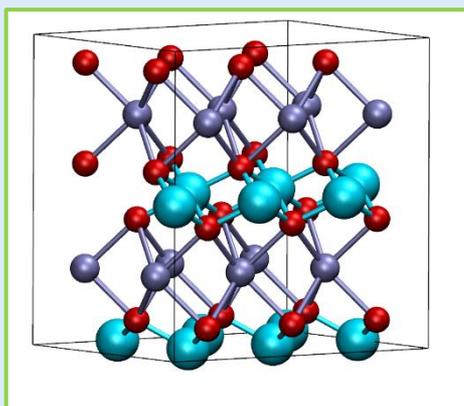
AI Analysis

ENEAGRID

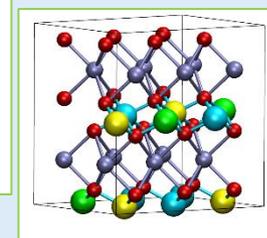
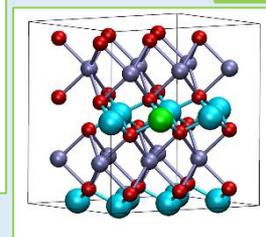
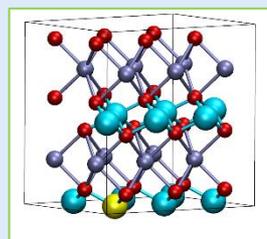
Material
 NaMnO_2

Pre-trained Graph Neural
Network

Indication of
optimum



Natural
Elements
Abundance



ENEA

Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

Simone Giusepponi - ENEA - TERIN - ICT



ConfGARR23
SAPERI INTERCONNESSI

Grazie dell'attenzione

www.mission-innovation.it/

iemap.enea.it

The screenshot shows the IEMAP website home page. At the top, it says "iemap (Italian Platform For The Accelerated Discovery Of Materials For Energy)" and "Access Private Area". The main heading is "Materials for Energy". Below it, a paragraph states: "The IEMAP project intends to create an experimental and computational infrastructure for the accelerated design and selection of advanced materials for energy." There is a "Get Started" button. To the right, there is a "What you can do?" section with three options: "Analyze" (Users can analyze data with predefined Jupyter notebooks directly on IEMAP servers...), "Share" (This can be done by: IEMAP Python module, Web interface (this one), REST API service), and "Search" (Users can search for materials for energy...).

The screenshot shows the Mission Innovation Italy website. The header includes the ENEA logo and "MISSION INNOVATION ITALY". Navigation links include "ABOUT MI ITALIA", "HYDROGEN VALLEY", "SMART GRID", "MATERIALS FOR ENERGY", "NEWS", "EVENTI", "DOCUMENTI", and "Cerca sito". There are "ACCEDI" and "REGISTRATI" buttons. The main banner features a futuristic image of a city at night with glowing energy lines and the text "Progetto di innovazione". Below the banner, there is a "MISSION INNOVATION accelerating the clean energy revolution" logo. Three project cards are displayed: "HYDROGEN VALLEY" (with H2 and HYDROGEN text), "SMART GRID", and "MATERIALS FOR ENERGY". Each card has a brief description and budget information.

massimo.celino@enea.it

simone.giusepponi@enea.it

ConfGARR23
SAPERI INTERCONNESSI