



Methane to Markets Meeting

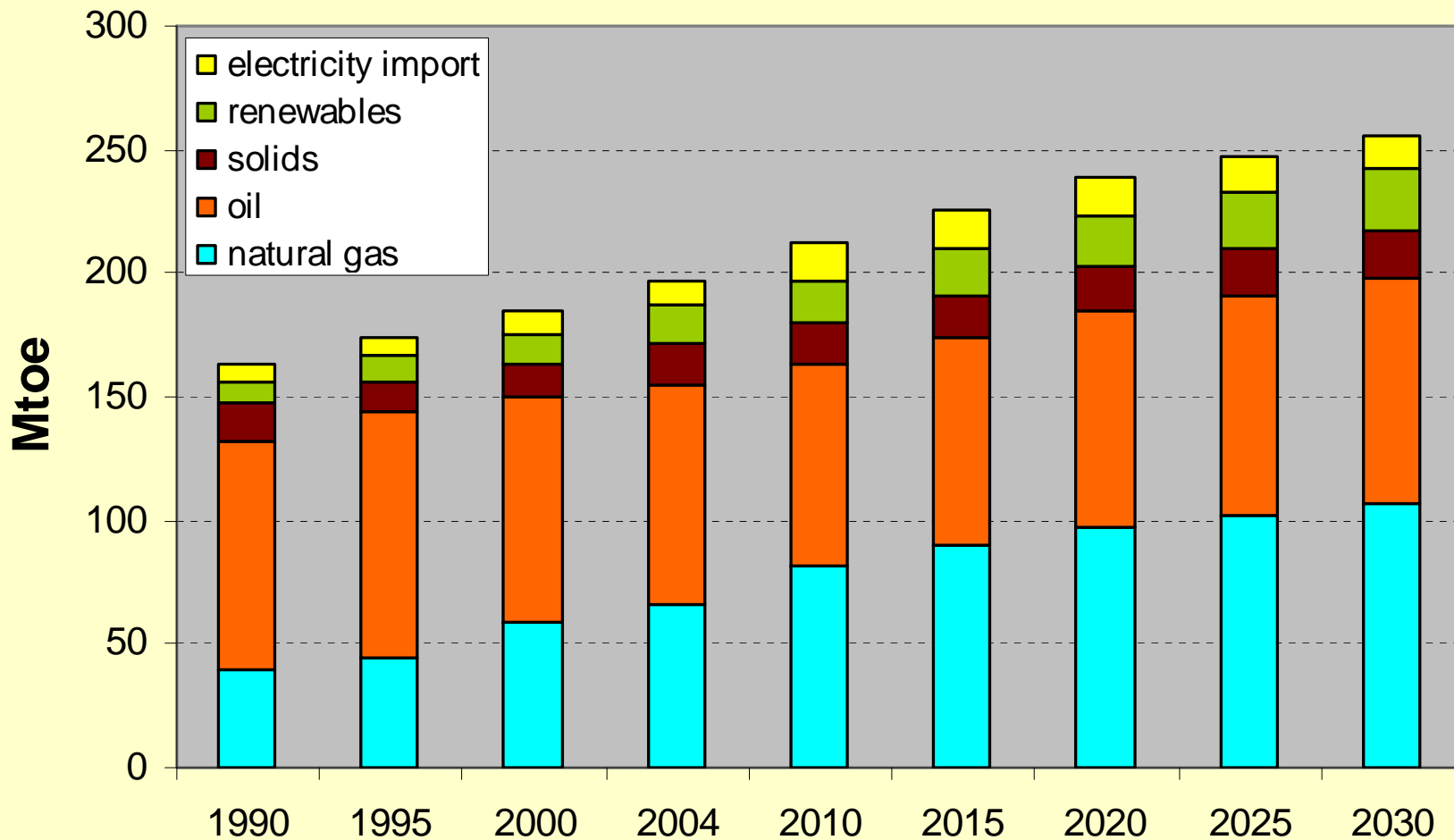
Cagliari, 29-30 April 2008

An Italian perspective towards a zero emission strategy

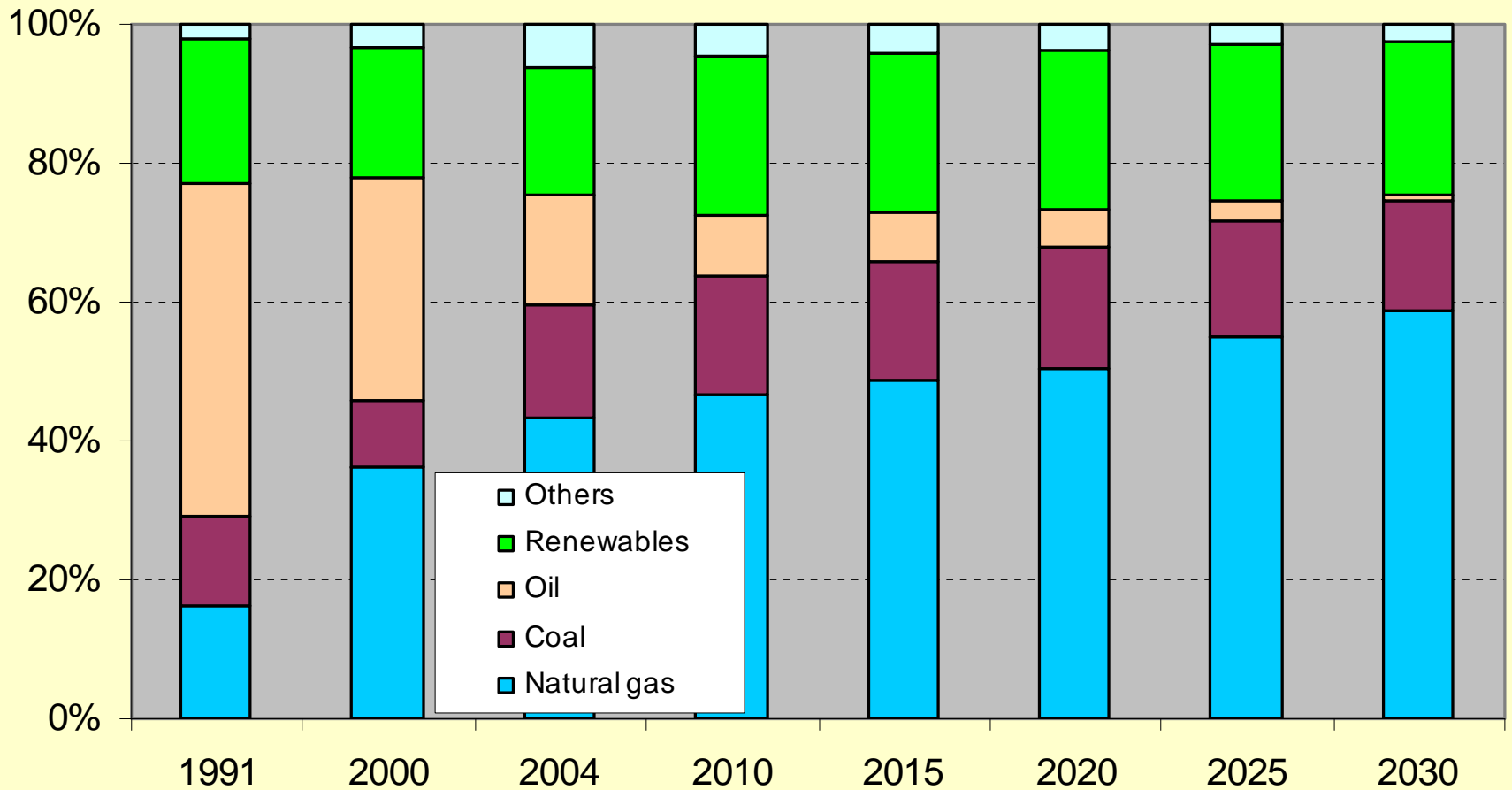
Marcello Capra

Ministry of Economic Development

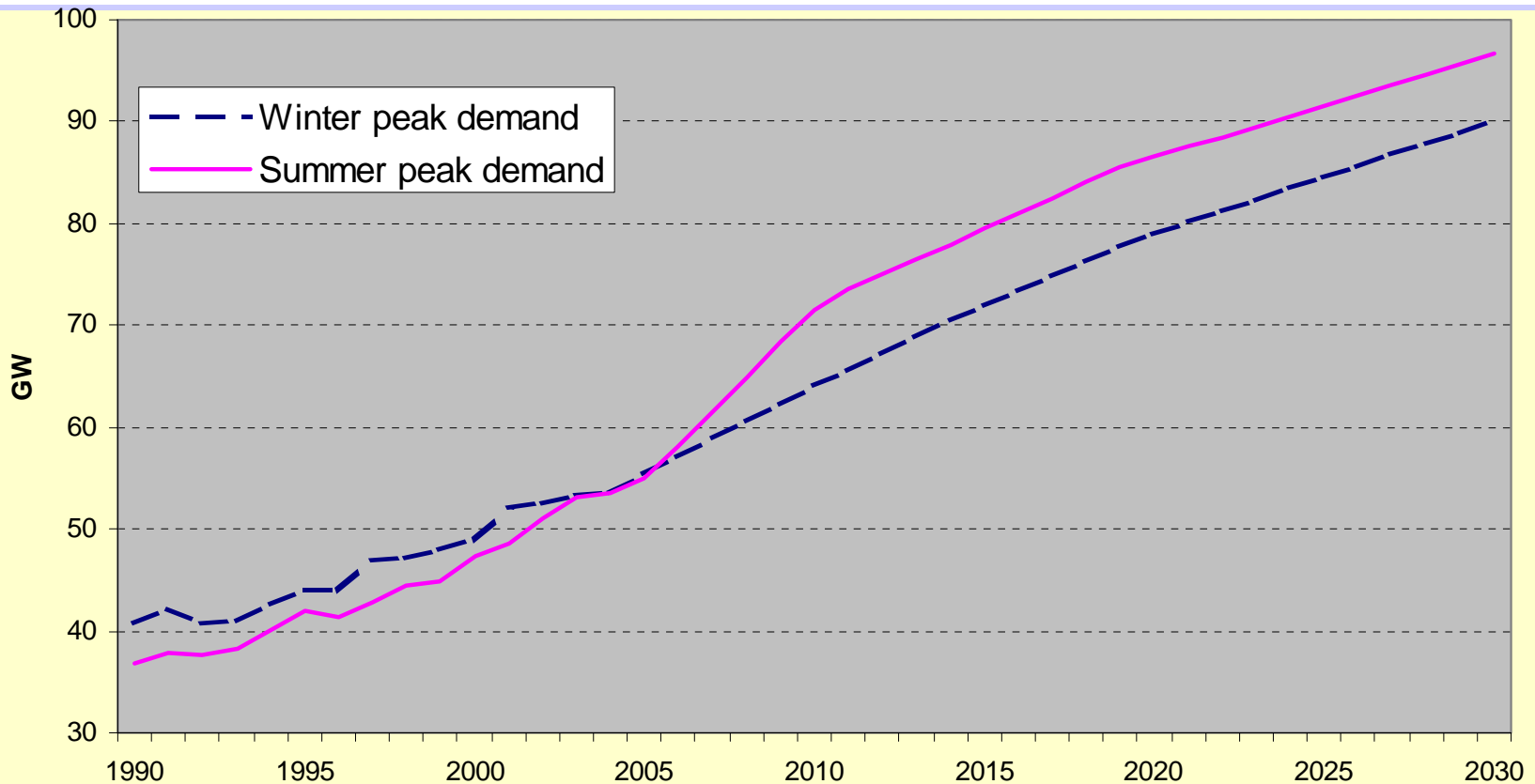
The energy demand



Electricity production share by fuel

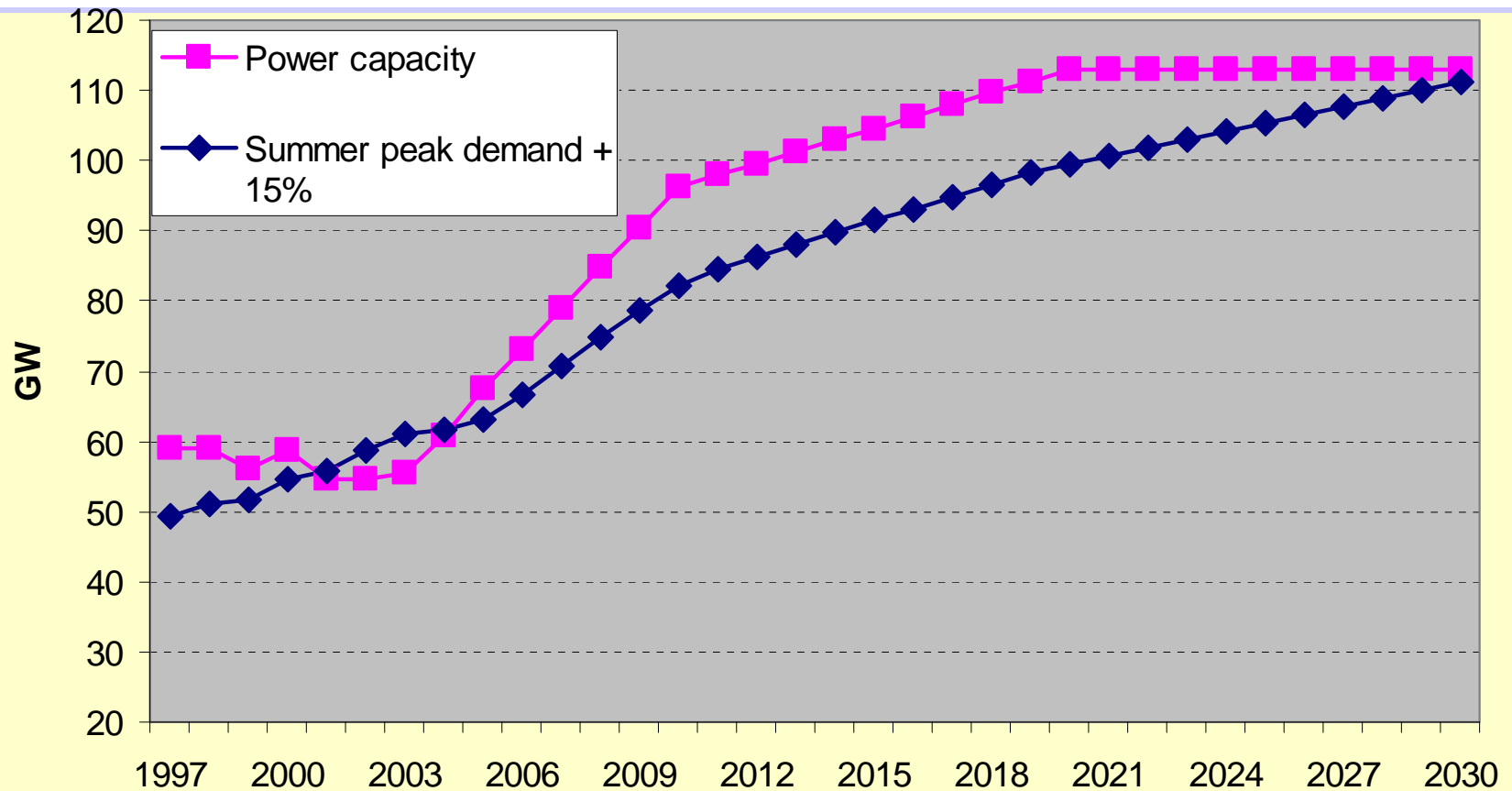


Peak demand capacity (1)



The winter peak demand shows an average growth rate of 2% pa, while the summer peak demand grows at an average rate of more than 2.3% pa

Peak demand capacity (2)



Power capacity (production + import) vs summer peak demand increased by a 15% safety margin

In order to overcome these problems, the Italian energy policy foresees:

In the medium-short term:

- **Diversify the energy suppliers**
- **Diversify routes and the related infrastructures**
- **Support the international dialogue between producers and consumers**
- **Increase energy efficiency both in electricity generation and in end-uses**
- **Diversify energy sources (coal and renewables)**

In order to overcome these problems, the Italian energy policy foresees:

In the medium-long term:

- **Emphasise energy diversification while coping with environmental concerns**
- **Continue the process of liberalisation of the electricity market towards retail market**
- **Increase security of energy supply**
- **Reduce energy prices and tariffs**
- **Streamline the authorisation procedures**

Greenhouse gas emissions in Italy

- **The Italy's commitment under the Kyoto Protocol is to reduce GHG emissions by 6.5% below 1990 levels by 2008-2012**
 - ➔ 486 Mt CO₂ per year is the target annual level in 2008-2012
- **GHG emissions have been growing gradually and were 12% above the 1990 level in 2004 reaching 583 Mt of CO₂ per year**
 - ➔ Existing gap: 97 Mt CO₂

The European “Energy Package”

- **‘Chapeau’ Communication: 20 20 by 2020 – Europe’s climate change opportunity**
- **Legislative proposals:**
 - » The Renewable Energy Directive on MS shares
 - » The ETS Directive for the post 2012 period
 - » The CCS Directive on the geological storage of CO₂
- **Communications to Council and EP:**
 - » The CCS Communication on early demonstration
 - » A Communication assessing MS en. Efficiency plans
- **Guidelines on State Aid to Environment Protection**

Impacts on CCS

- **The ETS Directive for the 2013 – 2020 period:**
 - » ETS is the market based instrument for low carbon
 - » CCS will be fully integrated in the ETS
 - » Safely stored CO₂ will be considered as not emitted
- **The CCS Directive:**
 - » Only geological storage will be acceptable
 - » Safety conditions and rules are established
 - » CCS will become a properly regulated activity
- **The CCS Communication:**
 - » CCS technologies will be needed by 2020
 - » CCS demonstration is to be promoted now

New issues for coal in Italy

- **Facing Emission Trading Scheme and National Allocation Plan at EU level (Directive 2003/87/EC)**
- **Development of a long-term vision strategy**
- **Stakeholders involvement**
- **Development of a new technology roadmap for coal combustion and zero emissions**

The perspective of coal

- **Short-term: keep existing fleet in service:**
 - ➔ Switch from oil to coal
 - ➔ Reduce carbon intensity and pollutants
- **Long-term: transition to near-zero emissions**
 - ➔ Advanced materials
 - ➔ Ultra-high efficiency systems
 - ➔ CO₂ capture and storage

Technological Carbon Management Options

Reduce Carbon Intensity

- Renewables
- Fuel Switching

Improve Efficiency

- Demand Side
- Supply Side

Sequester Carbon

- Capture & Storage
- Enhance Natural Sinks

Ocean

All options needed to:

- Affordably meet energy demand
- Address environmental objectives

Energy RTD in Italy

- **International and National Programmes**
- **Different measures for promoting Research and Innovation:**
 - ➔ **basic research**
 - ➔ **industrial and pre-competitive research**
 - ➔ **demonstration and dissemination**
- **National projects and programmes supported by:**
 - ➔ **National Government: short to long term**
 - ➔ **Ministry of Economic Development: short to medium term**
 - ➔ **Ministry of Research: medium to long term**
 - ➔ **Regional Governments: short to medium term**

Energy R&D National Programmes

- **Research National Programme (PNR):**
 - ➔ **Participants: Industries, Universities, R&D Centers**
- **Fund for R&D on the Electricity System:**
 - ➔ **Collect of electricity bills (<0.03 c€/kWh)**
 - ➔ **Main goal: technology innovation of the electricity system**
 - ➔ **3-years programme launched in 2007; funding: 230 M€**
- **Industria 2015:**
 - ➔ **Industrial technology innovation**
 - ➔ **3-years programme on Energy Efficiency is now launching: 2008-2010 funding: 200 M€**

Fund for R&D on Electricity System

→ Power Generation

- ✓ R&D for efficiency improvement on USC, IGCC
- ✓ Combined production of hydrogen & power with CCS

→ CO₂ Separation & Capture

- ✓ Quantify existing national potential capacity to storage CO₂ during the time
- ✓ ECBM Site-Tests in Sardinia (Sulcis Area)

International Cooperation

- **European Technology Platform on ZEFFPP**
- **European FP6 & FP7 on R&D**
- **Carbon Sequestration Leadership Forum (CSLF)**
- **Methane to Markets**
- **International Partnership on Hydrogen Economy**

Zero Emission Committee

- **The Ministry of Economic Development has set up in 2003 a National Committee in order to coordinate the Italian participation to all the international initiatives on Zero Emissions**
- **Main Italian actors actively involved: ENEA, ENEL, ENI, CNR, CESI RICERCA, ANSALDO, SOTACARBO, INGV, OGS, CARBOSULCIS, Universities**

CO₂ Underground Storage

- In Italy, from a general point of view, the geological storage of Carbon Dioxide is feasible.

Nevertheless it is very important now to indicate:

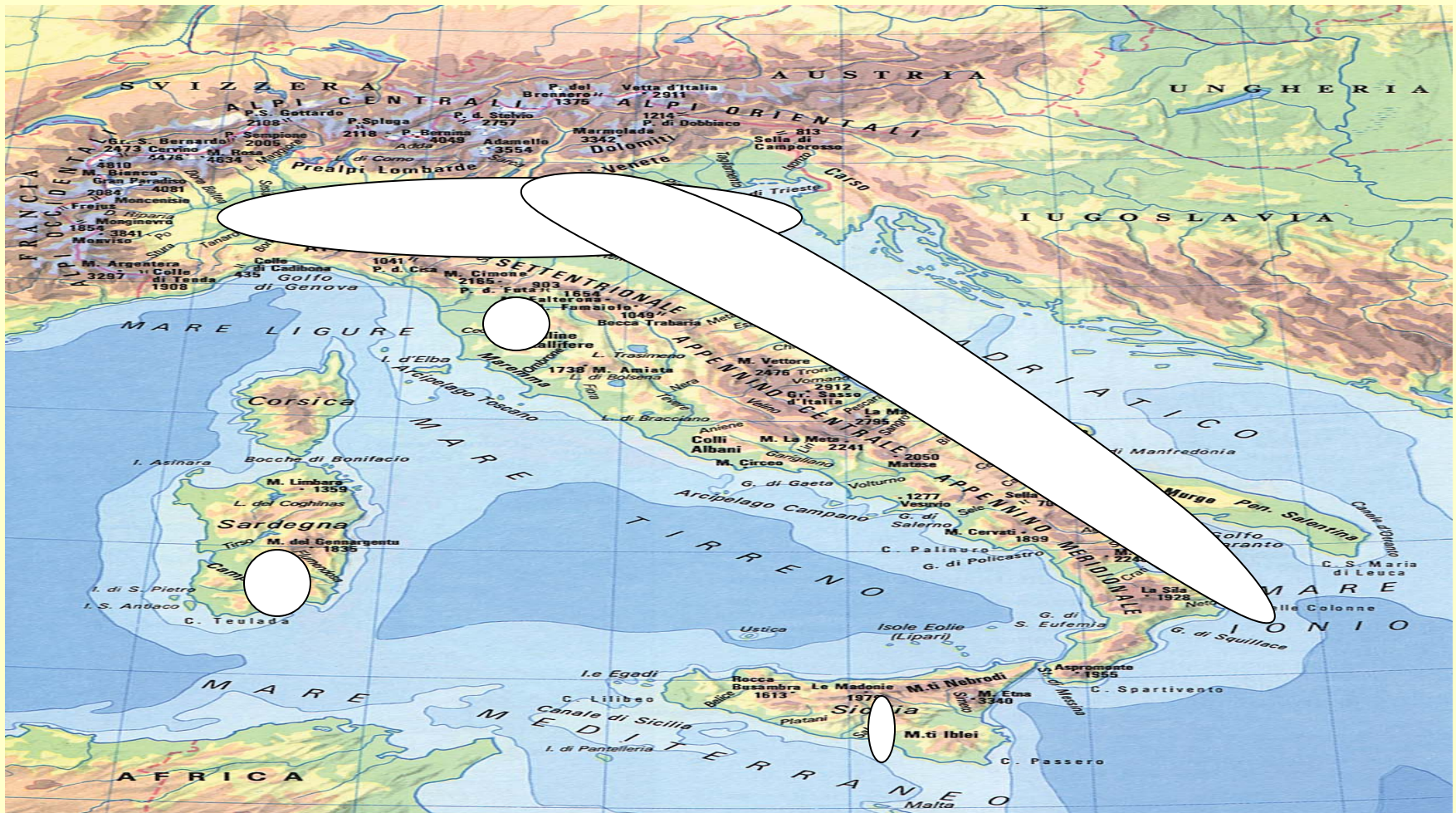
- ➔ **where,**
- ➔ **how much,**
and consequently
- ➔ **for how long**

we could store CO₂ without any risks for the population and the environment.

Where in Italy

- In Italy it is possible to storage CO₂ in depleted Oil and Gas reservoirs, in geothermal fields and in deep saline aquifers, either on-shore or offshore
- The saline aquifers are particularly well distributed in the Padanian back-arc basin and in the Adriatic Basins
 - ➔ These geological structure are extended from Padania Valley to the Sicily and seems to offer the presence also of different natural analogues, depleted oil and gas reservoirs useful for the project
- EOR could be studied
- ECBM could be studied: proposal regarding coal bed in Sardinia

Areas where the best geological formations are localized in Italy



Sardinian Coal Initiative

- **Enhanced Coal Bed Methane testing in the Sulcis area led by Carbosulcis S.p.a.**
- **R&D Centre on CCTs for coal syngas production with CO₂ & hydrogen separation led by Sotacarbo S.p.a.**
- **Launch of an integrated project for power generation from Sardinian coal**