

# **GREEN HOUSE GAS POLICY AND ACTIONS IN ITALY**

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# ITALY - ENERGY BALANCE 2004 (Mtoe)

(%)

	cons	dom	imp
OIL	88.0 45	5.4	82.6
NG	66.2 34	10.7	55.5
COAL	17.1 9	0.4	16.7
TOTAL FOSSIL	171.3 88	16.5	154.8 94
ELECTRICITY	10.0 5	-	10.0
RENEWABLES	13.5 7	13.5	-
TOTAL	194.8	30.0 15	164.8 85

# ITALY-ENERGY CONSUMPTION FORECAST (%)

»	1990	00	10	20	40
• IMPORTED E	5	5	7	6	4
• RENEWABLES	5	8	8	9	10
• FOSSIL	90	87	85	85	86

# **THE THREE SCENARIOS**

- **KYOTO PROTOCOL SHORT TERM  
2010-2012**
- **POST KYOTO MEDIUM TERM 2010-  
2020**
- **POST KYOTO LONG TERM 2020 - 2040**

# KYOTO PROTOCOL ACTIONS IN PROGRESS IN ITALY

- **Replacing old power plants with new ones more efficient**
- **Improving energy efficiency in housing**
- **Increase the share of renewables**
- **Replacing up to 50 % of the present car park with higher efficiency models**
- **Improving recycling and increasing waste to energy**
- **Increasing forestation for CO<sub>2</sub> temporary storage**

# KYOTO PROTOCOL

## ACTIONS IN PROGRESS ABROAD

- Design and implementing CDM projects in non annex 1 countries: Laos, China, Brazil, Argentina, Mexico, Uruguay, Nigeria, Morocco, Algeria, Tunisia, Israel, Egypt, Congo, Serbia
- JI projects in Romania and Bulgaria
- The Ministry for Environment established the **ITALIAN CARBON FUND** at the World Bank, an innovative tool to combine the dissemination of the Italian best energy technologies leveraging substantial investments in host countries while meeting the emission reduction obligation (200 M Euro)

# POST KYOTO MEDIUM TERM GOALS

- **BIOELECTRICITY**
- **H2 PRODUCTION FROM FOSSILS (CO2 free) AND ITS USE IN LARGE SCALE POWER PLANTS THROUGH HIGH EFFICIENCY COMBINED CYCLES**
- **H2 PRODUCTION FROM BIOMASS and FROM STANDARD RENEWABLES IN SPECIAL CONDITIONS and ITS USE IN DISTRIBUTED ENERGY PRODUCTION THROUGH FC AND MICRO TURBINES**

# POST KYOTO MEDIUM

## CRITICAL OBJECTIVES TO SUPPORT GOALS

- **GEOLOGICAL SURVEY FOR THE BEST SITES SELECTION**
- **AVAILABILITY OF KNOWHOWS FOR CO<sub>2</sub> INJECTION**
- **AVAILABILITY OF RELIABLE TECHNOLOGIES FOR H<sub>2</sub> PRODUCTION (INCLUDING O<sub>2</sub> PRODUCTION)**
- **AVAILABILITY OF RELIABLE LOGISTIC SYSTEMS THROUGH DEDICATED PIPING FOR BOTH H<sub>2</sub> AND CO<sub>2</sub>**
- **AVAILABILITY OF RELIABLE TECHNOLOGIES FOR BIOMASS GASIFICATION WITH AIR**



# POST KYOTO MEDIUM R&D&DEMO PRIORITIES

- **GEOLOGICAL SCIENCES AND GEOLOGICAL SURVEY FOR NO RISK STORAGE**
- **LONG TERM FORECAST THROUGH RESERVOIR MODELLING (PUBLIC ACCEPTANCE)**
- **COAL GASIFICATION TECHNOLOGY IMPROVEMENTS SIMILAR TO THE IMPROVEMENT ACHIEVED FOR NG REFORMING**
- **STATIONARY FC DEVELOPMENT (BOTH MCFC AND SOFC) FUELLED DIRECTLY WITH SYNGAS FROM BIOMASS OR DIRECTLY WITH H<sub>2</sub> FROM FOSSILS**
- **STATIONARY FC (COMBINED WITH MICRO TURBINES) DEMO UNITS TO SHOW UP THE BENEFIT OF THIS CONCEPT**

# POST KYOTO MEDIUM R&D&DEMO PRIORITIES

**DECREE n°63 March 16,2006**

**A three year R&D plan for the electricity system optimization has been funded – Call for project proposals underway**

**Projects key words:**

- **Coal clean technologies**
- **H2**
- **CO2 capture and storage**
- **Large power gen units and distributed energy units**

# POST KYOTO LONG TERM GOALS

- **H2 PRODUCTION FROM BIOMASS THROUGH DIRECT FERMENTATION PROCESS**
- **H2 PRODUCTION FROM WATER SPLITTING THROUGH THERMO CHEMICAL CYCLES USING HT SOLAR**
- **H2 PRODUCTION FROM WATER PHOTOLYSIS THROUGH CHEM, BIO AND ELECTROCHEM SYSTEMS USING LT SOLAR**
- **FT CITY BUS MASS PRODUCTION**
- **FC CYTY CAR MASS PRODUCTION**

# POST KYOTO LONG TERM CRITICAL OBJECTIVES

- **AVAILABILITY OF RELIABLE TECHNOLOGY FOR SELECTED BIOMASS FERMENTATION DIRECTLY TO H<sub>2</sub>**
- **AVAILABILITY OF RELIABLE TECHNOLOGY FOR WATER SPLITTING USING HT SOLAR**
- **AVAILABILITY OF RELIABLE TECHNOLOGY FOR LT WATER PHOTOLYSIS**
- **REDUCED COST OF HIGH POWER FC BUSES**
- **REDUCED COST OF FC CITY CARS**

# POST KYOTO LONG TERM R&D&DEMO PRIORITIES

- DEMO UNITS FOR THE HT TECHNOLOGY ALREADY AVAILABLE FROM THE HT NUCLEAR REACTOR TECHNOLOGY
- BASIC RESEARCH ON SELECTED BIOMASS FERMENTATION TO H<sub>2</sub>
- **BASIC RESEARCH ON WATER PHOTOLYSIS PROCESSES THROUGH CHEMICAL CATALYST, BIO CAT, AND ELECTRO-CHEM REACTIONS**
- INCREASE OF CITY BUS FLEET TESTS
- IMPROVEMENT OF FC TECHNOLOGY (PEM)
- INCREASE OF CITY CAR FLEET IN MOST POPULATED CITIES
- DEMO ACTIVITY WITH OPTIMIZED DESIGN AND REFUELLING SYSTEMS

# POST KYOTO LONG TERM R&D&DEMO PRIORITIES

- **Basic Research National Program on H2 and FC – First Year of activity already completed. Final results expected for June 2008**
- **H2 parks at regional level (8 already in progress, more at planning stage)**

# BASIC RESEARCH NATIONAL PROGRAM ON H<sub>2</sub> - FC

**35 project proposals presented on H<sub>2</sub> and FC**

- **14 approved (8 on H<sub>2</sub>, 6 on FC)**
- **total cost 128 million euros**
- **total funding 90 million euros**
- **more than 100 research groups from university, research institutes and industry involved.**



# REGIONAL H2 PARKS IN ITALY

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## **Hydrogen System Laboratory, Turin – Piedmont**

- **Bicocca Project, Milan – Lombardy**
- **Zero Regio Project, Mantova – Lombardy**
- **Arese Project, Arese – Lombardy**
- **Hydrogen Park, Marghera (Venice) – Veneto**
- **HBUS, Florence – Tuscany**
- **Arezzo Project, Arezzo – Tuscany**
- **HighValley, Abruzzo**



# INTERNATIONAL PARTNERSHIPS

- **IPHE**
- **CSLF**
- **M2M**
- **GBEP**
  
- **SINO – ITALIAN COOPERATION PROGRAM**
- **UK – ITALY COOPERATION PROGRAM**



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## **The G8 commitment in the Gleneagles Plan of Action:**

*“We (the G8) will promote the continued development and commercialisation of renewable energy by: [...] d) launching a Global Bioenergy Partnership to support wider, cost effective, biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent, following the Rome International Workshop on Bioenergy”.*

GBEP will be officially launched during CSD 14 Ministerial Segment.

# Main Functions of GBEP

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- Create a global high level policy dialogue on bioenergy, supporting national and regional bioenergy policy making and market development, and facilitating international cooperation;
- Favour more efficient and sustainable uses of biomass and develop project activities in the bioenergy field;
- Foster the exchange of information, knowledge skills and technologies by identifying and promoting potential areas of bilateral and multilateral collaboration;
- Facilitate bioenergy integration into energy markets by tackling specific barriers in the supply chain;
- Act as a cross cutting initiative, working in synergy with other relevant activities, avoiding duplications.

# SINO - ITALIAN COOPERATION

## SHANGHAI MUNICIPALITY - ITALIAN COMPANIES AND RESEARCH INSTITUTES THROUGH THE MINISTRY FOR ENVIRONMENT AND TERRITORY

- DEVELOP INNOVATIVE TECHNOLOGIES FOR PRODUCTION OF H<sub>2</sub> FROM RENEVABLES AND FOSSILS WITH CO<sub>2</sub> CAPTURE AND STORAGE
- PROMOTE FC TECHNOLOGY FOR BOTH AUTOMOTIVE AND DISTRIBUTED POWER GEN
- EXCHANGE EXPERIENCE ON H<sub>2</sub> STORAGE, LOGISTIC AND DISTRIBUTION IN POPULATED AREAS

# SINO - ITALIAN COOPERATION STARTED IN 2004

## 5 JOINT PROJECTS ALREADY IN PROGRESS

- MCFC FOR 1 MW DEMO FROM NG
- CO<sub>2</sub> SPLITTING INTO CO AND O<sub>2</sub>
- COAL GASIFICATION FOR IGCC WITH CO<sub>2</sub> CAPTURE AND STORAGE
- RENEWABLES IN BUILDING SECTOR
- H<sub>2</sub> REFUELLING STATION DEMO PROJECT IN SHANGHAI

**RESULTS (HARDWARE AND KNOW HOW) WILL BE PRESENTED  
AND SHOWN AT THE SHANGHAI EXPO 2010**

# UK – ITALY COOPERATION PROGRAM

**ON FEBRUARY 2-3, 2006 A WORKSHOP HAS BEEN HELD IN LONDON WITH THE OBJECTIVE OF DEFINING A COOPERATION PROGRAM UK- ITALY ON THE CLEAN COAL TECHNOLOGIES WITH SPECIFIC FOCUS ON COAL GASIFICATION (H<sub>2</sub> PRODUCTION) AND CO<sub>2</sub> CAPTURE AND STORAGE**

**THE WORKSHOP WAS WELL ATTENDED**

**FOLLOW UP PROGRAM PREPARATION IN PROGRESS**

# CONCLUSIONS – KYOTO SHORT TERM

## TARGETS

- further increase in energy efficiency
- more renewables
- CDM and JI

## ACTIONS

- Voluntary agreement Ministry for Environment and Industries
- Legislation on biofuels in the market
- Frame agreements with foreign countries for CDM and JI
- Carbon Fund at WB

# CONCLUSIONS – POST KYOTO MEDIUM TERM

## TARGETS

- **Bioelectricity**
- **New high efficiency power plants with H<sub>2</sub> from CO<sub>2</sub> free fossils**
- **Stationary FC**

## ACTIONS

- **Prefeasibility optimization studies on electric system**
- **CO<sub>2</sub> capture and storage**



# CONCLUSIONS – POST KYOTO LONG TERM

## TARGETS

- H<sub>2</sub> production from new renewables
- Automotive FC

## ACTIONS

- Basic research program on bioH<sub>2</sub> and water photolysis
- Basic research on automotive FC for cost reduction

# CONCLUSIONS

**Strong commitment in International Partnerships as the best way to:**

- **Share our vision and compare it with yours**
- **Share knowledge and programs**
- **Perform joint projects in R&D& DEMO activities**
- **Contribute to a global policy and definition of new energy system CO<sub>2</sub> free (economics)**
- **Foster cooperation among our and your industries**