

Minister,

Madame Commissioner,

President Sartori

Dear colleagues

Ladies and Gentlemen

It is a great honour to have been invited to give this closing keynote speech on shaping research for a low carbon society in the context that has been offered us by the ENEL Foundation.

To begin with, let me say a few words about my past experience with ENEL. ENEL has a long standing reputation for remarkably high levels of investment in research and innovation. It has also consciously sought to promote fruitful collaboration with universities and research institutes across the world. Today, I work as an MEP, where I sit on the ITRE committee. However, over the course of my career, I was lucky

enough to have worked with ENEL in my capacity as a researcher and university Professor at the Technical University of Lisbon.

When I worked with ENEL - with Mr Sauro Passini and Juliano Trebi in particular - we worked on a range of projects from coal to oil combustion to bio-mass geothermal/solar /hydrogen technologies.

*Slide 2 (General themes)*

The main purpose of my speech today is to describe how H2020 might contribute to shaping research leading to a low carbon society. I have divided my speech into three parts.

\* I should like to begin by offering you a brief overview of the developments that have been made in the field of energy production until the present day.

\* In the second part of my talk, I shall go on to envisage something of the road that lays ahead. This involves the ambitious goals that Europe has set itself in the domain of

energy with particular regard to the Energy Roadmap 2050 and the SET plan. I should like to finish by outlining the role of H2020 in the future of energy research.

### *History and Example*

#### *Slide 3 World Energy Timeline: an example of energy research*

From a historical point of view, the main focus of research between the sixties and the eighties was how best to decrease combustion based emissions from energy production. From the nineties onwards, the emphasis shifted towards CO2 reduction.

#### *Slide 4 Combustion Repowering*

In the sixties, we had very high levels of emissions from SOx, NOx and particulate matter. As a result of a determined effort - from both the public and the private sectors - we were able to *dramatically* reduce these emission levels - as the slide indicates. This required considerable investment, it is true, but it serves as a source of optimism as we contemplate the

draconian reductions in emissions that we wish to achieve by 2050. At this point, let me talk you through three more slides

#### *Slide 5 Boiler*

As you can see, this slide shows the outline of one of the Vado Ligure Boilers. Following several years of fundamental research - whose goal was to model the combustion process involved in lowering NO<sub>x</sub> emissions - an innovative technique was applied to a full scale 320 MWe boiler. The major breakthrough was that, for the first time, coal over coal reburning was successfully applied in a full scale energy production boiler. By the way, our achievements were the result of collaboration between ENEL and several universities: I was in charge, for my part, of the theoretical and modelling work.

#### *Slide 6*

This slide gives you an idea of the complexity of the modelling work that was required with regard to the interior of the boiler.

#### *Slide 7*

This slide shows the scale of the reduction that we were able to achieve: emissions fell from around 600 mg/ cubic metre to 200mg/ cubic metre. If we were able to achieve such significant reductions in the past, why can we not achieve similar results - in the future - in the fields that concern us today?

### ***The Future***

#### ***Slide 9 Roadmap***

Let me turn now to the future. To begin with, as you will know, Europe has decided to reduce greenhouse gas emissions to 80 to 95% (by comparison with 1990 levels) by 2050.

#### ***Slide 10 sectoral milestones***

If we look at the breakdown of the contribution made by the different sectors, it stands out that the power sector has a Herculean task before it: the sector is expected to reduce emissions by up to 99%. Certainly, this involves a transition period - by 2030 - where power supply is expected to drop to 54 to 68%.

*Slide 11 Potential of Technologies*

To achieve such ambitious goals will require a determined effort to at once develop new technologies but at the same time to consider how best to align the whole range of technologies that we already have at our disposal. Whilst some of these technologies are already available, some are still in need of technological development and demonstration. This is the case with the technologies that should have come on line by 2030. These include CCS, advanced bio-fuels and geo-thermal technologies, hydrogen and wave energy.

Lastly, there is fusion - It would be unwise to hazard an accurate prediction about when this technology will actually be commercially exploitable but it is probably not unreasonable to suppose that it will be somewhere around 2050. Incidentally, in our modest way, we in the Parliament have made a step in the right direction by giving the green light to the ITER project in the Budget Committee.

## **Horizon 2020**

### *Slide 12 Energy R+I*

Let me turn now to how H2020 will allow us to shape research aimed at fostering a low carbon society. In this respect, energy research is one of the societal challenges included in H2020. The title of this challenge is "Secure, clean and efficient energy". This research compliments the nuclear research that is to be undertaken within the Euratom context.

The Commission proposal, in this respect, was at once comprehensive and well-thought out. However, we in the Parliament have tabled a number of amendments whose goal is to further improve the Proposal. In particular, we have suggested a budget increase of 16.5% for this societal challenge. Whether or not we obtain this increase depends on the negotiations that are currently underway between the three Institutions.

### *Slide 13 Societal Challenge 3*

Such an increase in the budget will be necessary because the Parliament is arguing in favour of an enlargement in the scope of the priorities laid down within the energy societal challenge. I shall not go through all seven priorities proposed by the Commission but bring out the additional priorities that the Parliament believes are necessary. Basically, there are four of these:

- \* increase energy efficiency
- \* develop new technologies for energy storage
- \* further develop back up and balancing technologies
- \* give greater visibility to the Intelligent Energy Europe III programme.

## **Conclusions**

Against this background, let me finish by, firstly, mentioning three overall challenges that I believe we must confront - with the aid of H2020 - if we are to promote a



sustainable, efficient and hence competitive European energy sector. These are

- \* Firstly, ensure adequate security of supply,
- \* Secondly, reduce the cost of transition to a low carbon energy market,
- \* Thirdly, enable consumers to save, produce and store energy in the local economy.

Beyond this, as my example of the huge improvement in air quality that ENEL and others achieved during the eighties and nineties suggested: I believe that it is possible to make real progress towards a low carbon society.

However, we cannot achieve our ambitions unless we give ourselves the means to accomplish the ends we are pursuing. This supposes political courage at all levels, synergies between the public and private sectors and adequate levels of investment in energy research, technological development and full-scale demonstration.