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The first time I became involved with renewable energy as part of my parliamentary responsibilities was back in 1996. I was a member of the Environment Committee of the European parliament and my colleagues entrusted the “Green Book” to me.

At that time the phrase “energy crisis“ still seemed like a foreign language. The price of oil was between 10 and 20 dollars, and even dipped below ten dollars for a short while. It was therefore a very wise decision on the part of the European Commission at that time to draw up a scenario stretching out to 2010 and beyond.

At the end of the 20th century, Europe was 50% dependent on energy that came from outside the European Union. The White Book tells us that, by 2020, this dependence can increase to 70 percent.

The world of energy has completely changed since 1996 – much faster and more dramatically than any forecast ever anticipated. On the other hand, the realisation that the solution of the energy question is one of the defining issues of the 21st century is only gradually gaining ground.

Global production of photo-voltaic modules was 100 megawatts per year. The power that was generated in this way could not be seen in any national statistics. It was a niche technology – but there has been a fascinating change in recent years. Next year, so many photo-voltaic plants will be connected to the world’s distribution grids that their combined production will equal that of an atomic power station – 8 gigawatts.

The issue of energy supply in the 21st century is an issue of the production of raw materials. According to studies of the Ludwig Bölkow Institute in Munich, oil consumption peaked in 2006; in other words, the maximum volume produced was exceeded. This means that the oil price will rise beyond the record high reached earlier this year. The relatively low level to which the oil price has since dropped will not change this fact.

A major German gas trader has calculated that, in 2020, there will be a 27% shortfall in natural gas volumes. We should be aware that one of the three major owners of gas reserves, Russia (the other two are Qatar and Iran), is buying up all the natural gas reserves around Europe. Gazprom chief Alexei Miller stated this summer that he expected gas prices to quadruple in the coming years.

The world’s reserves of uranium are so small that it will not be possible to replace gas and oil with atomic energy.

Where can we obtain the energy for the 21st century? The answer is simple, very simple. From the only functioning atomic fusion reactor – a reactor which is operating at a safe distance from planet earth.

But the important point is that we must understand that the energy that this reactor is beaming towards us can be used as a raw material. This is the key issue in energy policy for the 21st century. We must recognise that light is a valuable raw material.

The French physicist Alexandre Edmond Becquerel noticed in 1839 that two discs of platinum immersed in dilute acid produced more current when sunlight fell on the apparatus. Albert Einstein was able to explain the phenomenon in 1905 and was awarded the Nobel Prize for his explanation in 1921.

It was the brilliant German technologist Werner von Siemens who realised that photo-voltaics would play an enormous part in energy production in the future. In 1954, the first PV cells were used to power an American satellite (Vanguard). In 1978 the first operational PV plant was connected to the power grid.

I believe that after the invention of the wheel, the discovery that it is possible to transform light into power in the form of electrical energy is one of the greatest discoveries that mankind has ever made. It is a step in the right direction if we recognise that light is a raw material, because we can then discuss the basic parameters involving this raw material. How long will this raw material last? Probably another five billion years. What does this primary energy cost? Nothing – and that too will remain true for another 5 billion years unless some mad politician hits on the idea of taxing the sun.

The parameters surrounding energy supply will change as fossil fuels become more scarce. Two issues will stand out above all others – security of supply and price stability. Both can only be guaranteed by energy sources whose primary energy is almost infinite and cost-free.

Switching to renewable energy requires a thought process that takes place in our heads. This is a decentralised production in many, many locations and the use of this energy via connections to the power grid.

When this matter was discussed 10 years ago, the discussion was all about smoothing the way forward for this future technology. Today the discussion is about guaranteeing the wide-spread application of this technology in combination with other renewable energies such as wind, water and biomass.

But what about quantities? An area in the Sahara of 700 by 700 kilometres would be sufficient to supply all the power that is consumed in the world. It is, of course, not very sensible to generate energy in a single location and transport it around the world.

So how does the use of photo-voltaic energy look at the present time?

There is no uniform energy policy in the European Union. Each country has its own system – this one is ambitious, that one is less so. I don't want to go into detail here, but in those countries which have concrete, well thought-out infeed rules such as Germany, France, Spain, the Czech Republic and others, we can already see dramatic growth. In 2010, Germany will already produce 1% of its power by photo-voltaic means.

In the last few weeks the European Photovoltaic Industry Association (EPIA) made people sit up and listen when it made a statement which was considered to be very ambitious and optimistic.

The statement was that, by 2020, 12% of all the power consumed in Europe would be generated by photo-voltaic plants.

Where did this forecast come from?

The basic assumption was that what is called ”grid parity“ would be achieved. “Grid parity” means that the cost of manufacturing a kilowatt-hour using photo-voltaics is the same as the price that the consumer must pay for the power.

There are a number of parameters that will determine when this point is reached. But if it is to be achieved, the assumption is one of ultra-fast change.

The points are: the rise in the price of electricity generated by fossil and nuclear fuels. The question is “How will the prices of oil, coal, gas and uranium develop in the next few years?

The next parameter is “How will the costs of PV modules change and what will be the degression rate of photo-voltaic energy? It is the only technology that is becoming cheaper.
There is also one further parameter. What will be the technological advances, the new developments and the efficiency increases?
We can assume that grid parity will be achieved in favourable regions as early as 2010 to 2012. Such regions are southern Italy and southern Spain.
If conditions are optimal, grid parity could also be systematically achieved in central Europe between 2015 and 2020.
In the phase in which we find ourselves today, the issue is one of creating national frameworks which allow these developments to take place.
We must hold fast to the underlying idea during this process – the idea that price stability and security of supply in power generation and energy supply must be guaranteed in the coming years and decades.
Consider only that what we hold most dear – our mobility - will not be able to survive in the long term on the basis of burning fossil fuels. Our mobility will be electric.
The arguments for renewable energies must also be considered using these points of view.
As fossil resources become scarcer, we are faced with completely new situations – often sooner than we expect. Every investment in independence in energy supply is not a subvention or subsidy but a sensible economic investment in the maintenance of security of supply and price stability.
Our nuclear fusion reactor, the sun, also beams heat to us. Making use of this heat is therefore the pressing need of our time. Wherever heat is generated, we can also transform heat into cold.
Technical progress has also been made here.
The use of solar heat will basically develop automatically and will correlate very closely with price movements in the fossil sector.
We will also be able to generate power in southern Europe using thermal power plants and turbines.
We are in the middle of an exciting development phase in our use of energy. Managing this phase will be the central issue for prosperity and peace in the future.