

WHAT ENERGY FUTURE AFTER THE WORLD OIL PRODUCTION PEAK?

This EAGE Student Lecture for 2009-2010 will present three subjects which at first view could seem only loosely connected, but which in fact attempt to present a consistent and credible view of the long term world energy future.

The first subject will be a reminder of how the “world energy system” has in fact worked during the last fifty years or so: a system regulated both in quantitative terms and in price terms by oil. It will be shown how this system itself became regulated by OPEC since the mid-seventies, and that in fact Saudi Arabia regulated OPEC. The resulting question of this first part is: can such a system continue when two major new constraints are developing – peak oil and climate change – more or less simultaneously, with both having closely interrelated consequences.

In a second part this lecture will summarize what is really known about these two constraints, and what can be our guesses as far as their medium and long term influences are concerned. Will the peak be a short or a long plateau, and what could the world oil production decline curve look like? What changes in fossil fuel future production and future prices could be triggered by the climate change constraint? These are the basic questions.

In a third and last part an original view of the world energy long term future will be proposed for further reflection. This view is based on the idea that oil, gas, coal and nuclear will become increasingly interrelated and that in particular the oil industry and the nuclear industry will develop strong synergies. The basis for such a view is that the oil industry itself will need more and more energy, whether heat or electricity, and more and more hydrogen: if carbon emissions constraints become important, as we believe they will, then the oil industry should use more and more non-CO₂ emitting sources for its own energy and hydrogen requirements. Heat and hydrogen should therefore be increasingly produced thanks to nuclear. By way of example, it will be shown how the automobile industry could adjust to this process.

In conclusion a somewhat paradoxical vision of the long term energy future will be presented, highlighting that peak oil and climate change will trigger major developments for the oil industry. However, this future should be a “golden age” for the oil industry with an ever increasing “brain content” per barrel. If this view is correct, students should favor joining the oil industry if they wish to enjoy challenging but fascinating careers.