

The role of combustion in the future energy system

Mikael Odenberger*

Division of Energy Technology, Chalmers University of Technology, Göteborg, Sweden

**Mikael.Odenberger@chalmers.se*

Abstract

The energy system has developed in an almost evolutionary manner since the industrial revolution. Yet, the contemporary debate in media as well as in the political arena, seem to be stuck in expressions of opinions that reflect a polarized perception of “best practise”. For example, the historical build-up of the power sector indicates different investment regimes in technology of which much has been a response to a growing energy demand. Thus, looking at trends over time several shifts in the preferred technology can be seen, e.g. from coal to oil to nuclear and more lately to natural gas in combined cycles. From an investment point of view, it is most likely that a fossil fired power plant built during the late 60s or 70s have reached its technical lifetime and, if not already, replaced with a reinvestment. However, any long-lived power plant, part of the system for decades, has probably faced several different power system characteristics in terms of technology mix, fuel market dynamics and not the least different policy regimes. As of today, there is a strong growth, for different reasons, in employment levels of renewables, which reshapes the system surrounding within the energy system. Moreover, digitalisation and automation enables new solutions to regulate the system. At the same time, there is an increasing interest of electrification of energy demands historically depending on fossil fuels (in transport as well as in industry). Thus, the dynamic nature of the development of the energy system demands that the technologies adapt and respond to new circumstances, yet, this does not by any means need to imply that conventional technologies cannot play a significant part in the future. Looking ahead on different development routes for the energy system there is in many cases a role to play for thermal combustion plants to complement variable renewables, and in some cases, continue to serve as the backbone technology.