



# **Impact of Special Gas Consumption Tax in Electroproduction on the Greek Electricity Market**

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# Outline

- **Greek Electricity Market**
  - **Developments in the last year**
- **Natural Gas Pricing and its linkage with**
  - **Pricing at International hubs and long-term contracts**
  - **Variable costs of electroproduction units**
- **Influence of energy taxation on natural gas on:**
  - **System Marginal Price of electricity**
  - **Mix in Electroproduction**
  - **Trade in Interconnections**
- **Conclusions**

# **Greek Electricity Market evolution in last year**

**Since 30/09/2011 the Greek Electricity Market operation is split in**

- Day Ahead Schedule (DAS) Market**
- Imbalance Settlement**

**The DAS market is dominant in money transactions (> 90%)**

**The DAS System Marginal Price has been initially decreased, allowing private Load Representatives to gain market in consumption from PPC**

**The implementation of “Penalties” has been implemented to discourage speculation and gaming of the market**

**The implementation of special consumption taxation in electroproduction from natural gas units has raised questions over its suitability**

# Natural Import Gas Pricing

**Stern and Rogers (Oxford Energy Studies) question the rationale of the continuing linkage of prices in long term natural gas contracts to those of oil products.**

**Latest data provide evidence on moving to hub-based prices, namely the natural gas markets are evolving independently from oil markets.**

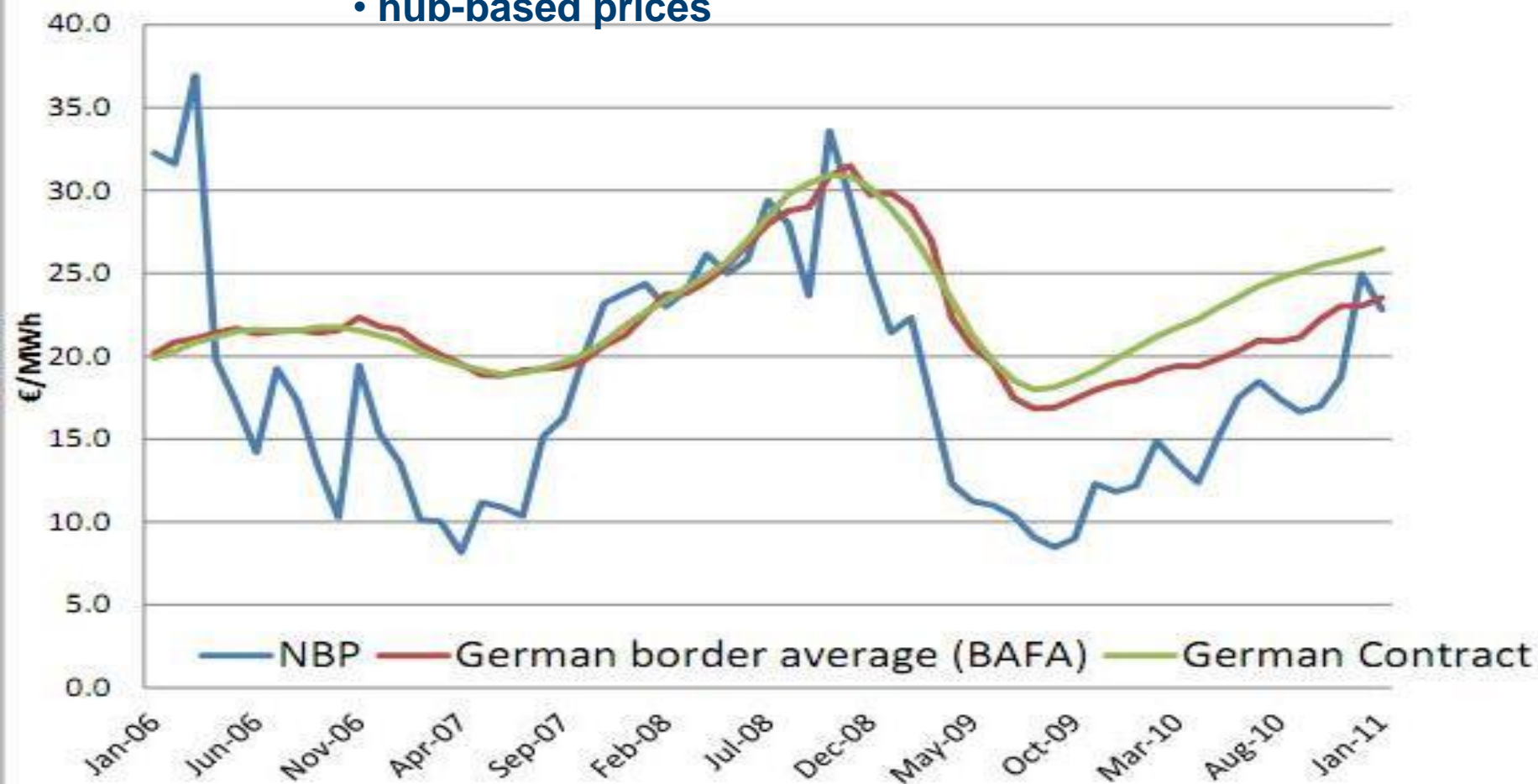
**Natural Gas import pricing in Greece seems, as most European markets, to move steadily from oil-linked pricing to hub-based pricing.**

**Natural gas pricing for electroproduction is further depending on volume and demand curves of gas units.**

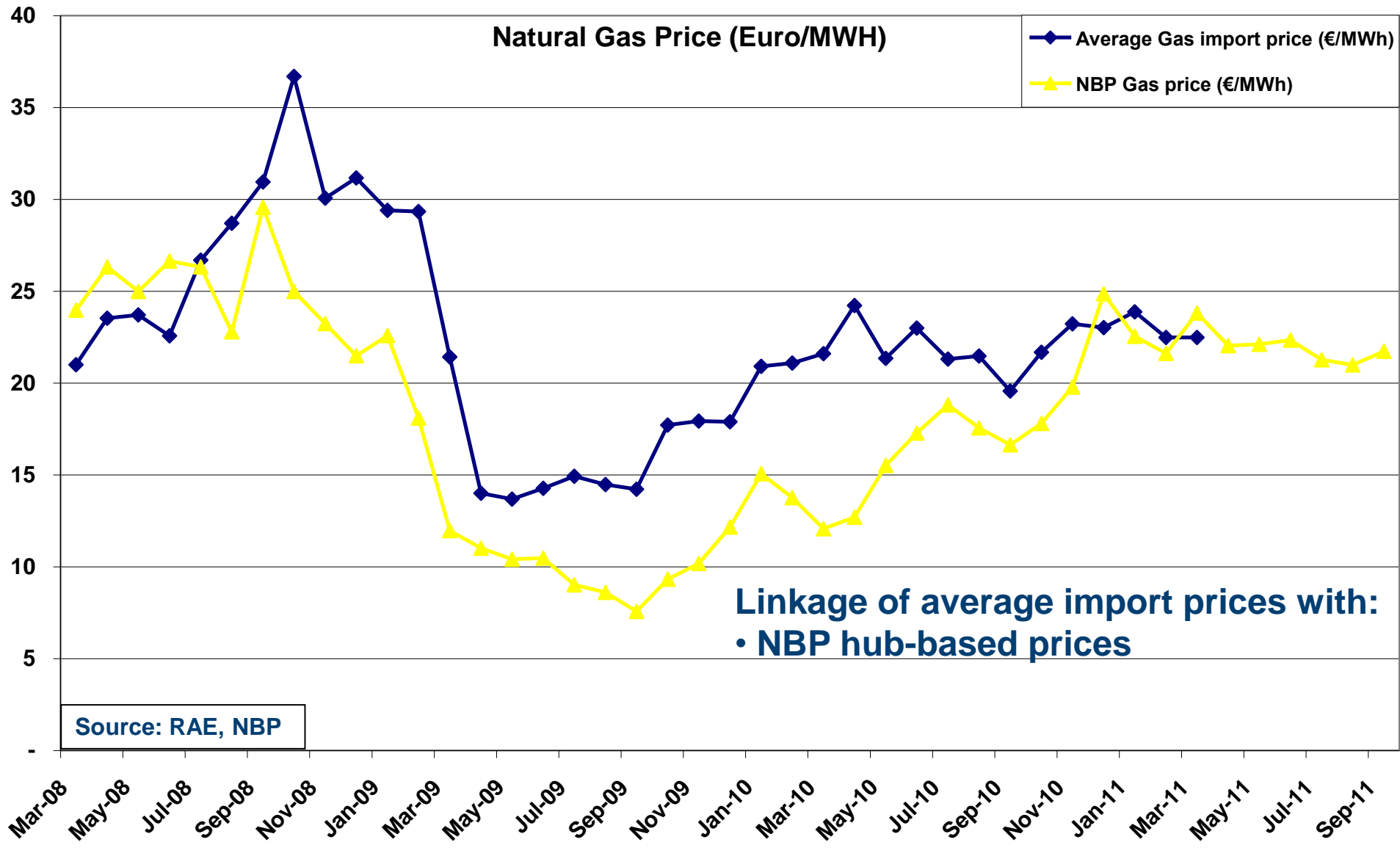
# Natural Import Gas Pricing

Linkage of average import prices with:

- long-term contracts and
- hub-based prices



# Natural Gas price in €/MWh



# Special Consumption Tax

## on electroproduction from Natural Gas Units

Since 01 September 2011, a special Consumption Tax (SCT) is imposed on electroproduction from natural gas units, equal to:

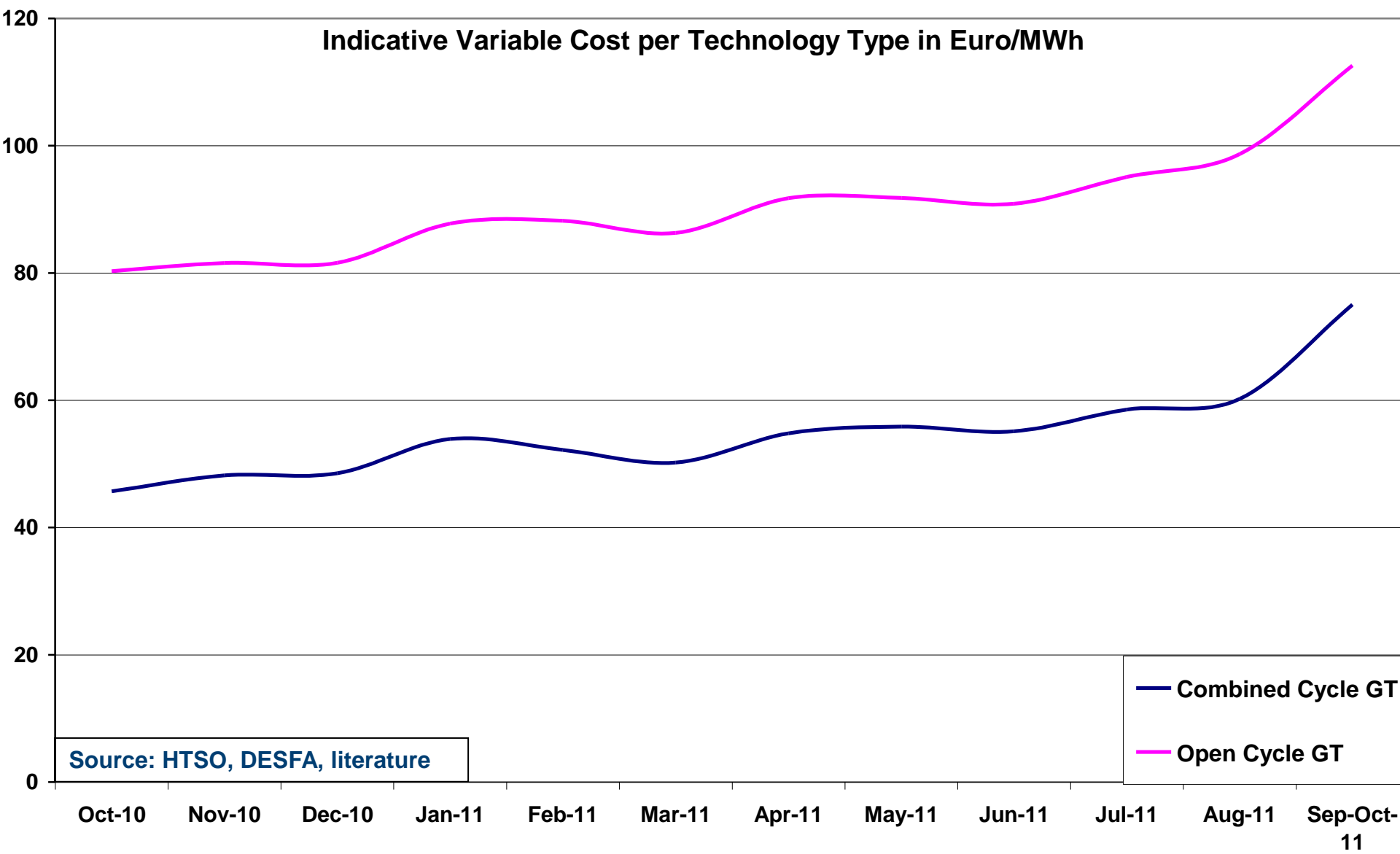
**1.5 Euro/GJ (=5.4 Euros/MWh)**

which leads to an increase in the fuel cost of gas units by about 10-18 Euros/MWh, considering efficiencies in the range 33-60% (Open Cycle – Closed Cycle Gas turbines) and the relevant VAT

Variable costs of units consists of

- fuel cost
- O&M costs (are usually constant or slightly increasing with generation)

# Indicative Variable Cost of Gas units per Technology type in €/MWh

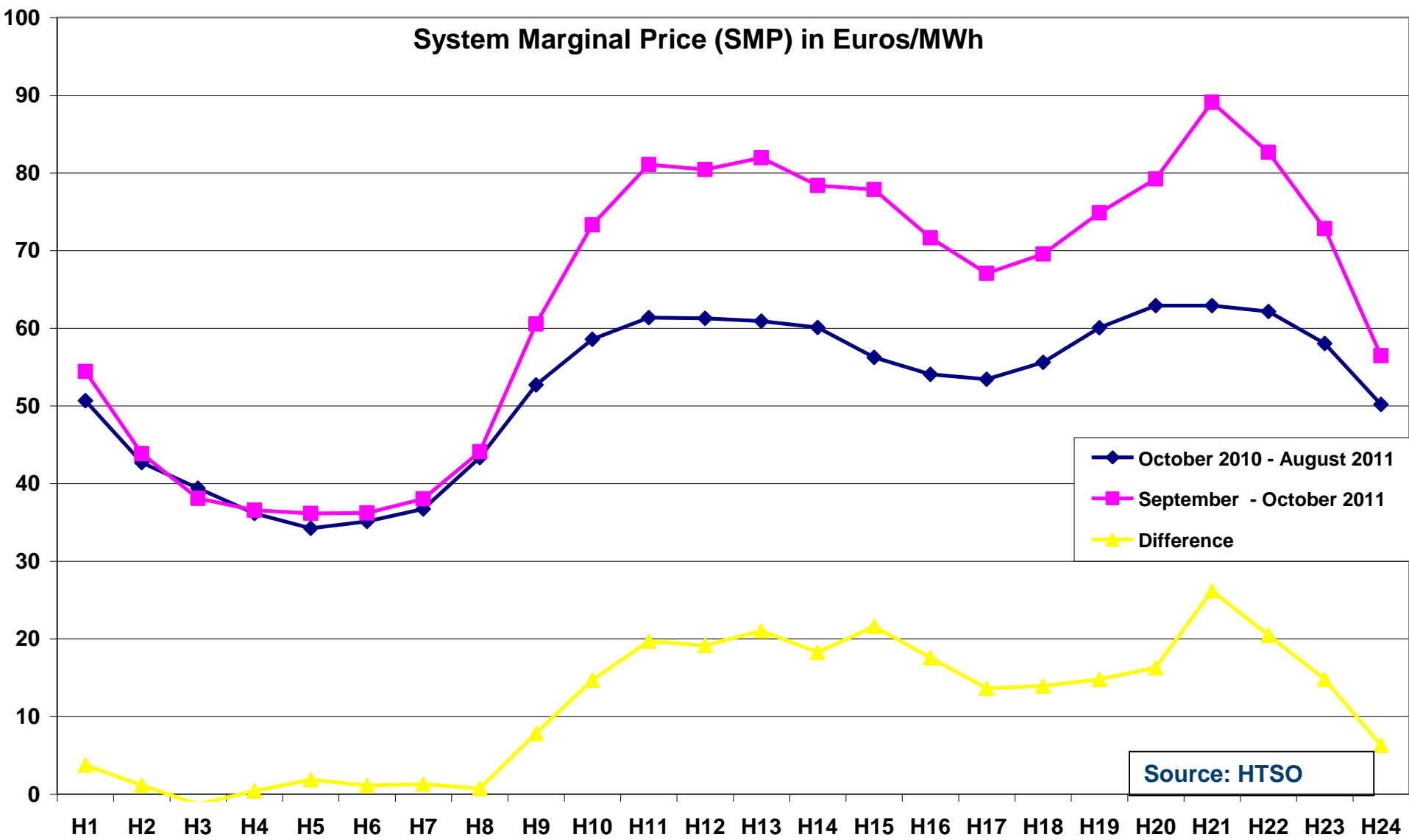




**Special Gas Consumption Tax  
influence in  
System Marginal Price**

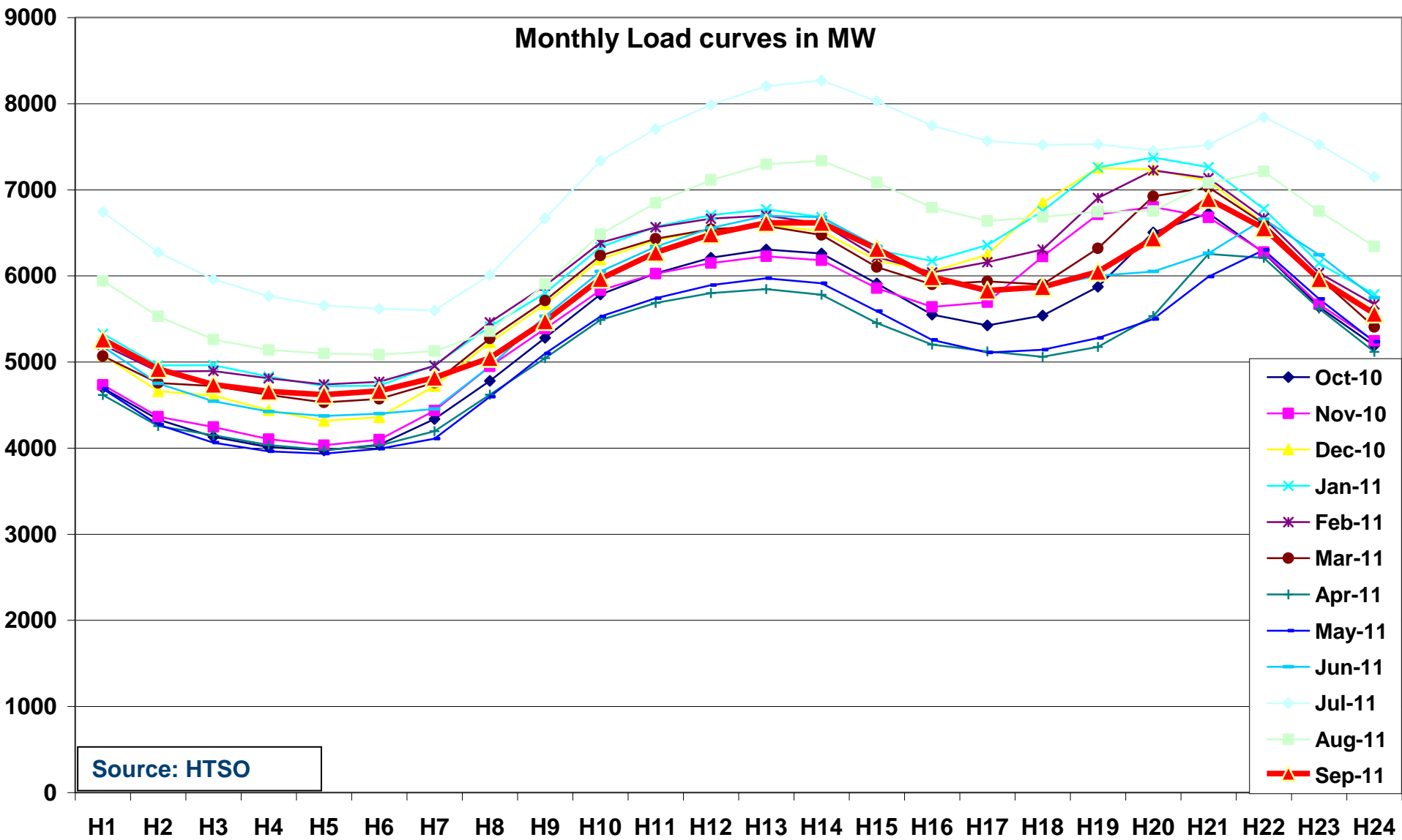
# Day Ahead Scheduling

## System Marginal Price in €/MWh



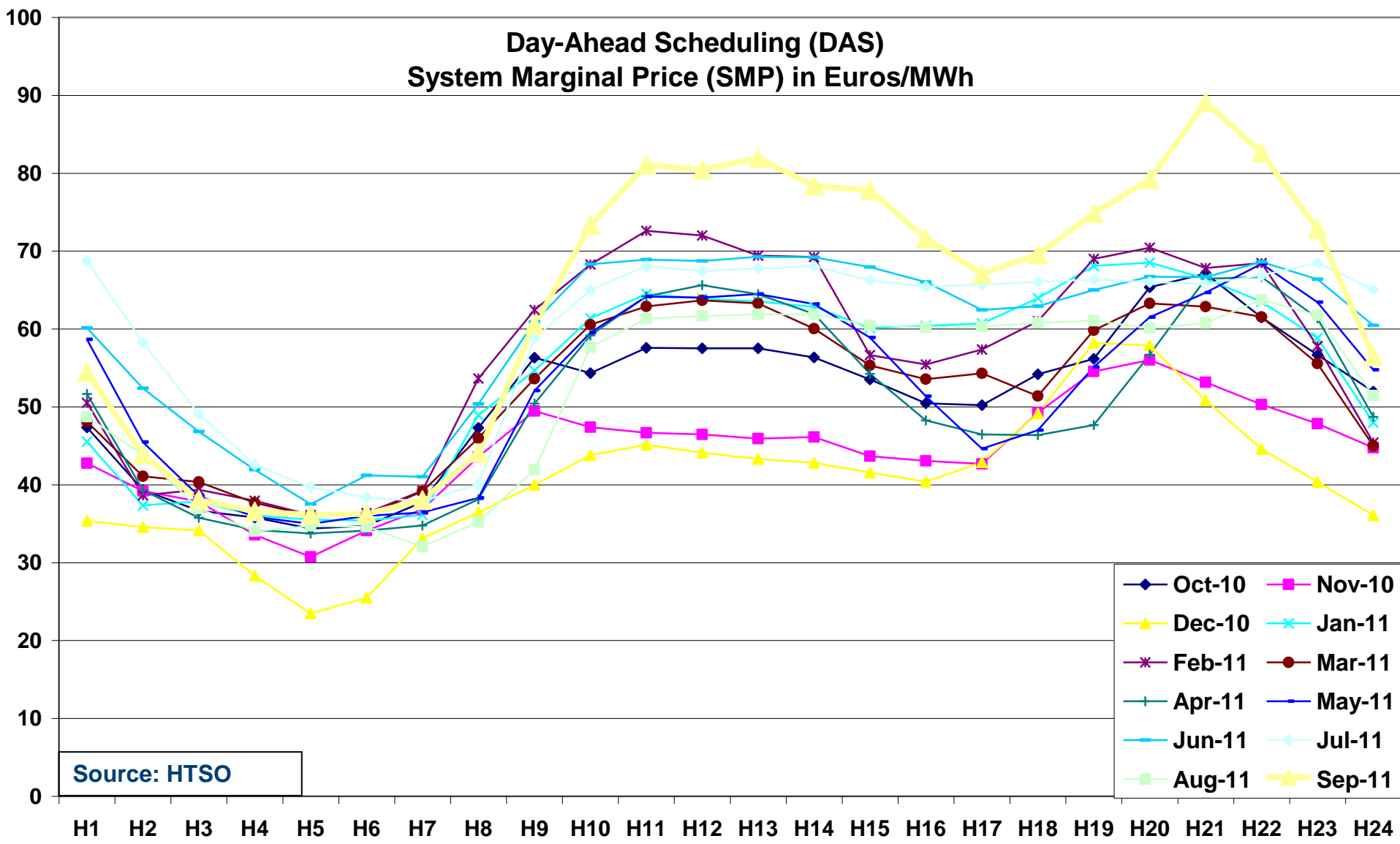
# Day Ahead Scheduling

## Load Declarations' Curves in MW



# Day Ahead Scheduling

## System Marginal Price in €/MWh



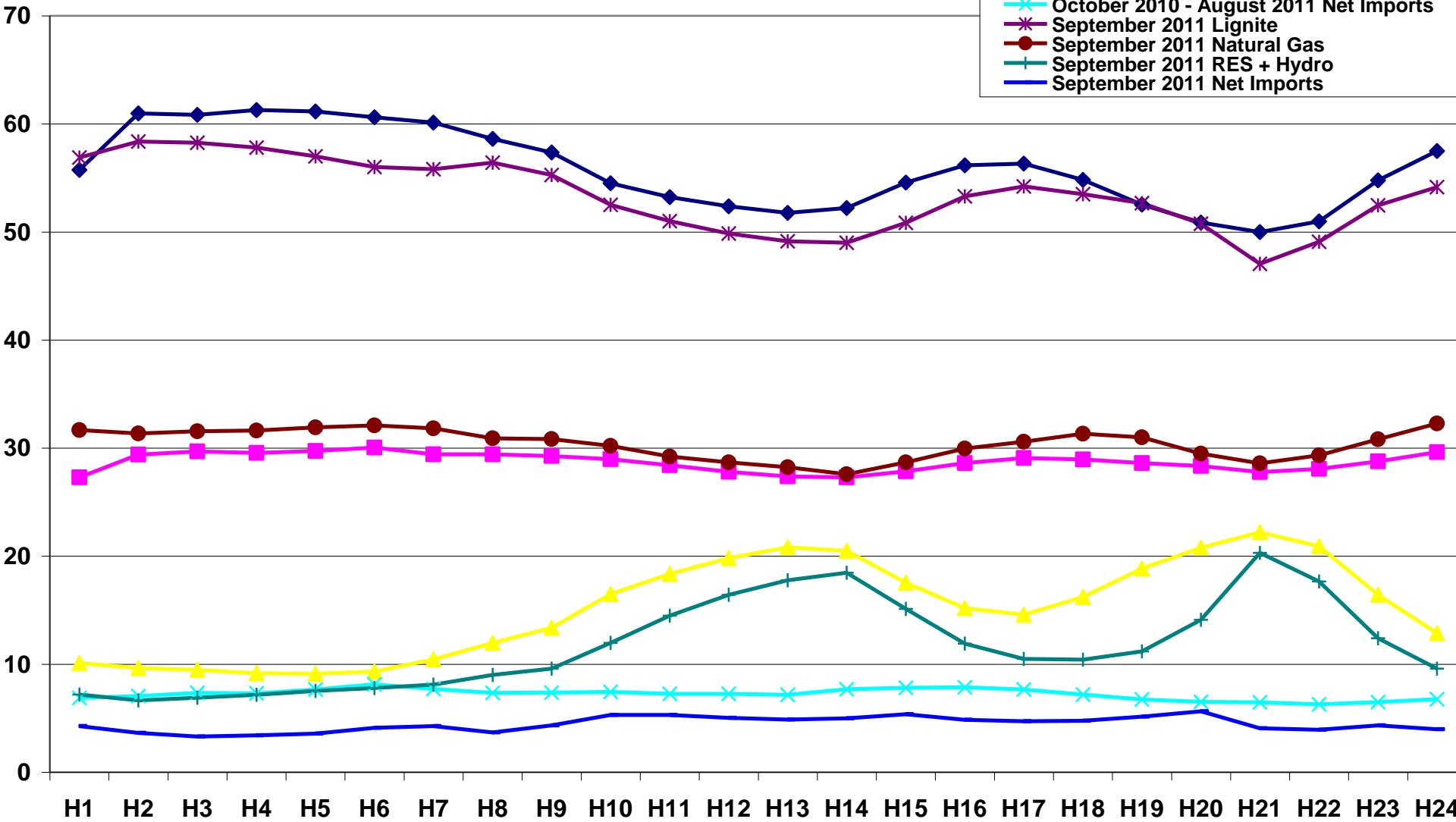
**Special Gas Consumption Tax**  
**influence in**  
**Electroproduction mix**

# Fuel share in electroproduction in %

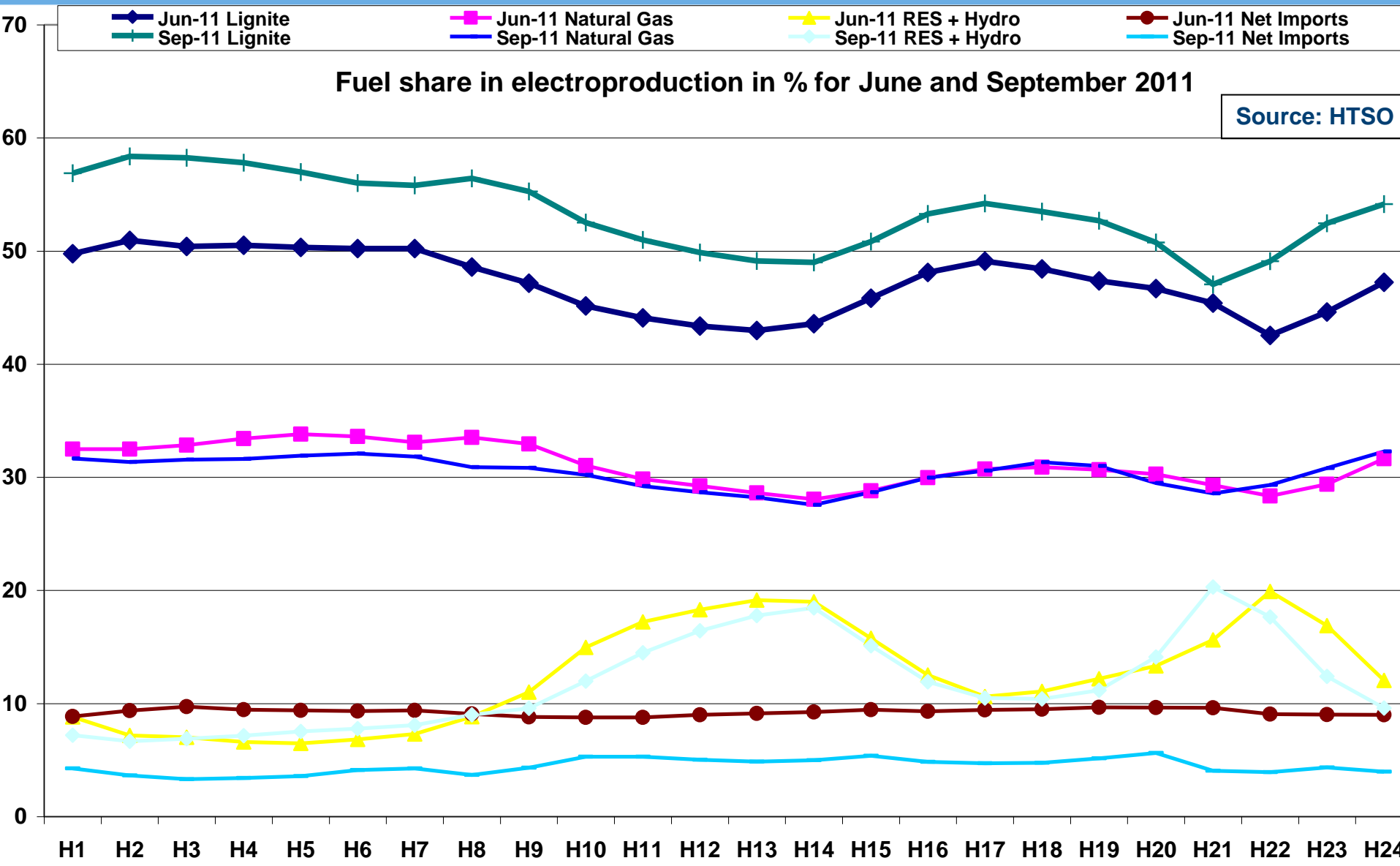
Source: HTSO

Fuel share in electroproduction mix (%)

- ◆ October 2010 - August 2011 Lignite
- October 2010 - August 2011 Natural Gas
- ▲ October 2010 - August 2011 RES + Hydro
- ✕ October 2010 - August 2011 Net Imports
- \* September 2011 Lignite
- September 2011 Natural Gas
- + September 2011 RES + Hydro
- September 2011 Net Imports



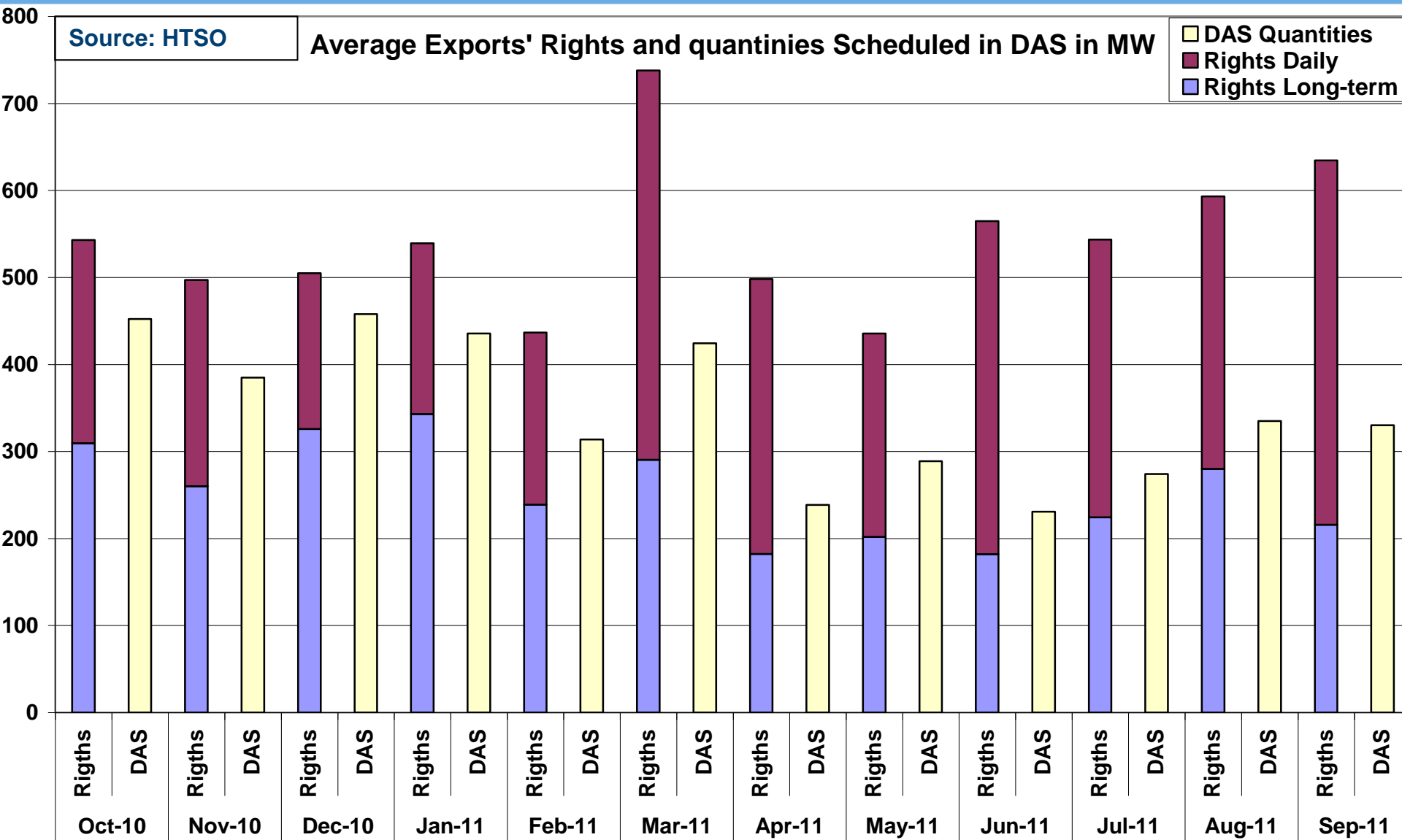
# Fuel share in electroproduction in %



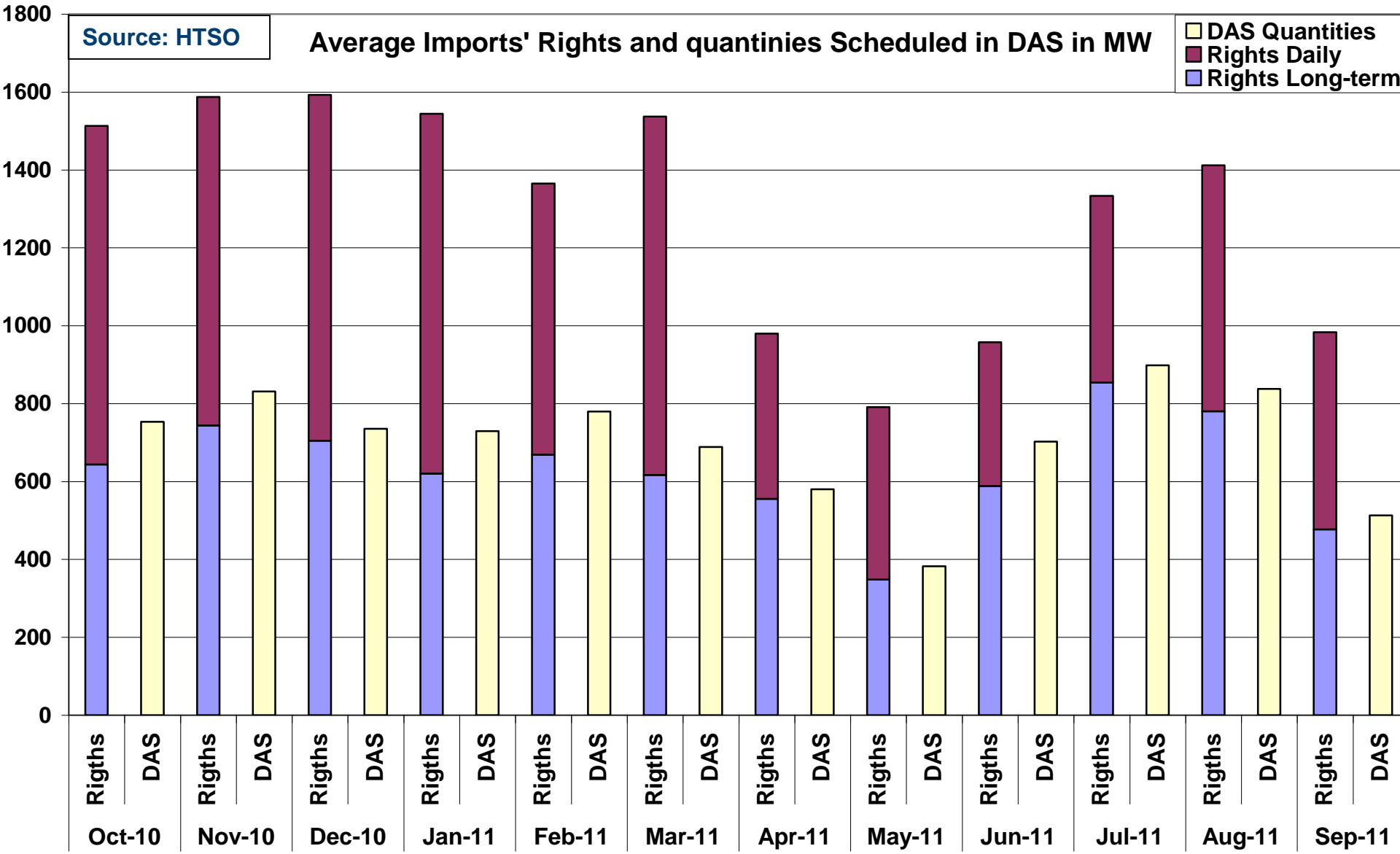
**Special Gas Consumption Tax**  
**influence in**  
**interconnections trade**



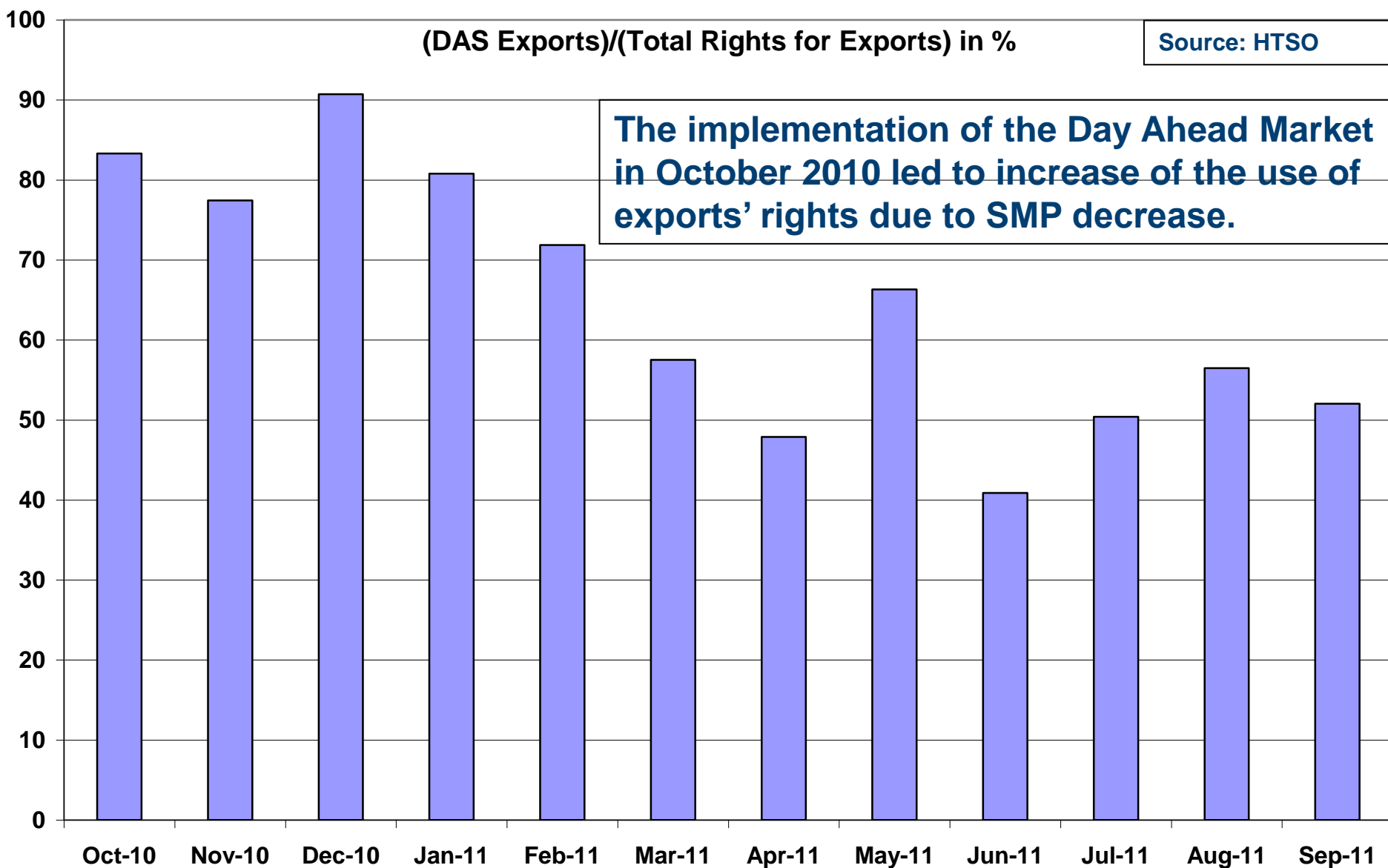
# Day Ahead Scheduling behaviour of Exporters



# Day Ahead Scheduling behaviour of Importers

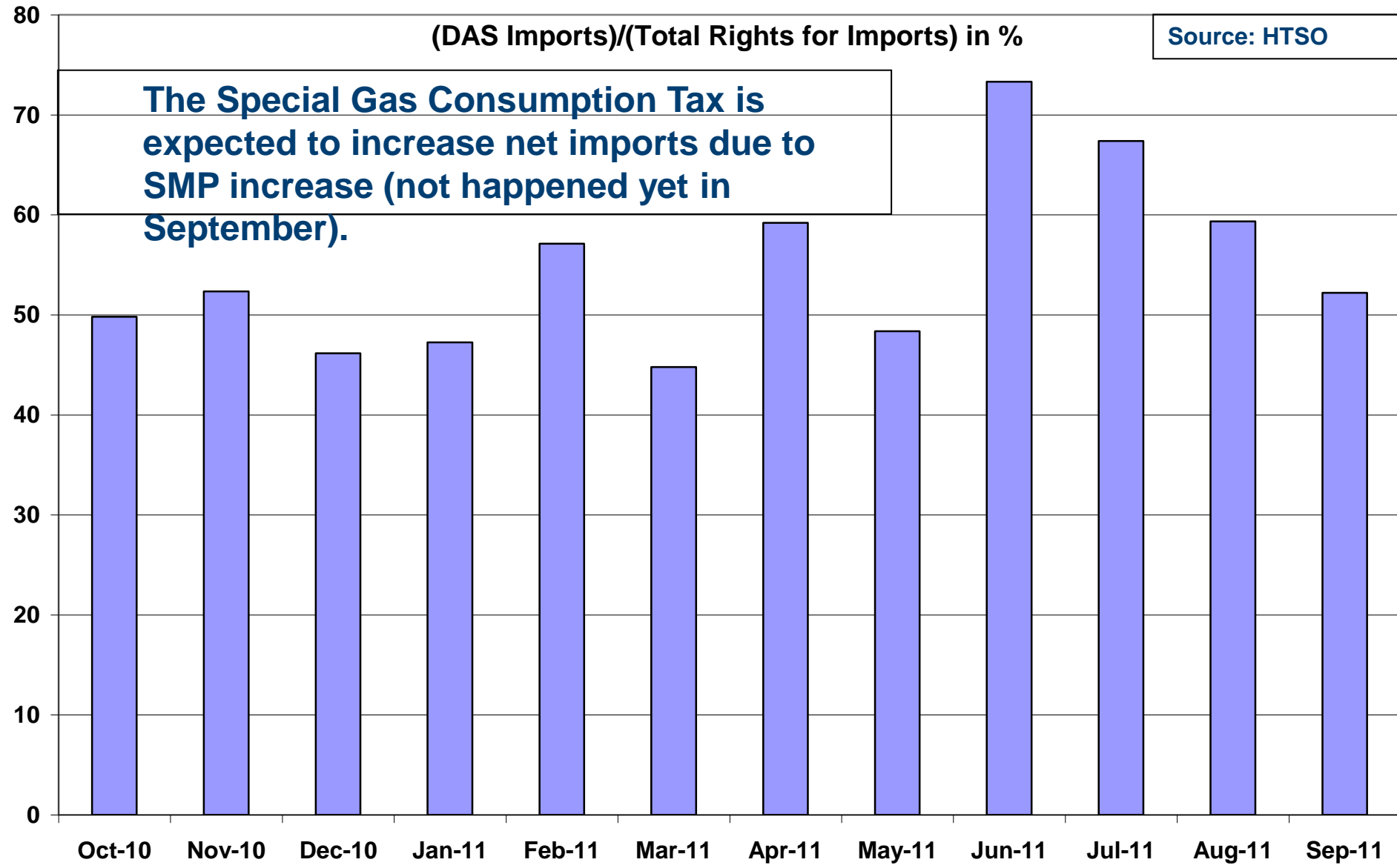


# Day Ahead Scheduling behaviour of Exporters



# Day Ahead Scheduling

## behaviour of Importers



# Overall Conclusions

**The implementation of Day Ahead Schedule and the further Code developments (Penalties, Recovery Cost...) has led to:**

- Decrease initially in System Marginal Price
- Change in Exporters behaviour and Increase in Exports initially
- Increase of share on Load representatives and decrease of PPC' share

**Natural Gas Pricing** for electroproduction is related:

- internally to the volume and demand curve and
- internationally to evolution of oil products markets and gas hub-based pricing

**The implementation of Special Consumption Tax in Gas units led to:**

- Increase of System Marginal Price 10-20euros/MWh for most of the hours, about 8euros/MWh in average for each hour.
- No significant change in the electric mix yet
  - Natural Gas production remains at same levels.
  - No significant change in Exporters/Imports behaviour for the time being, but it is expected for the future