


# Optimal produktion af 2. generations brint

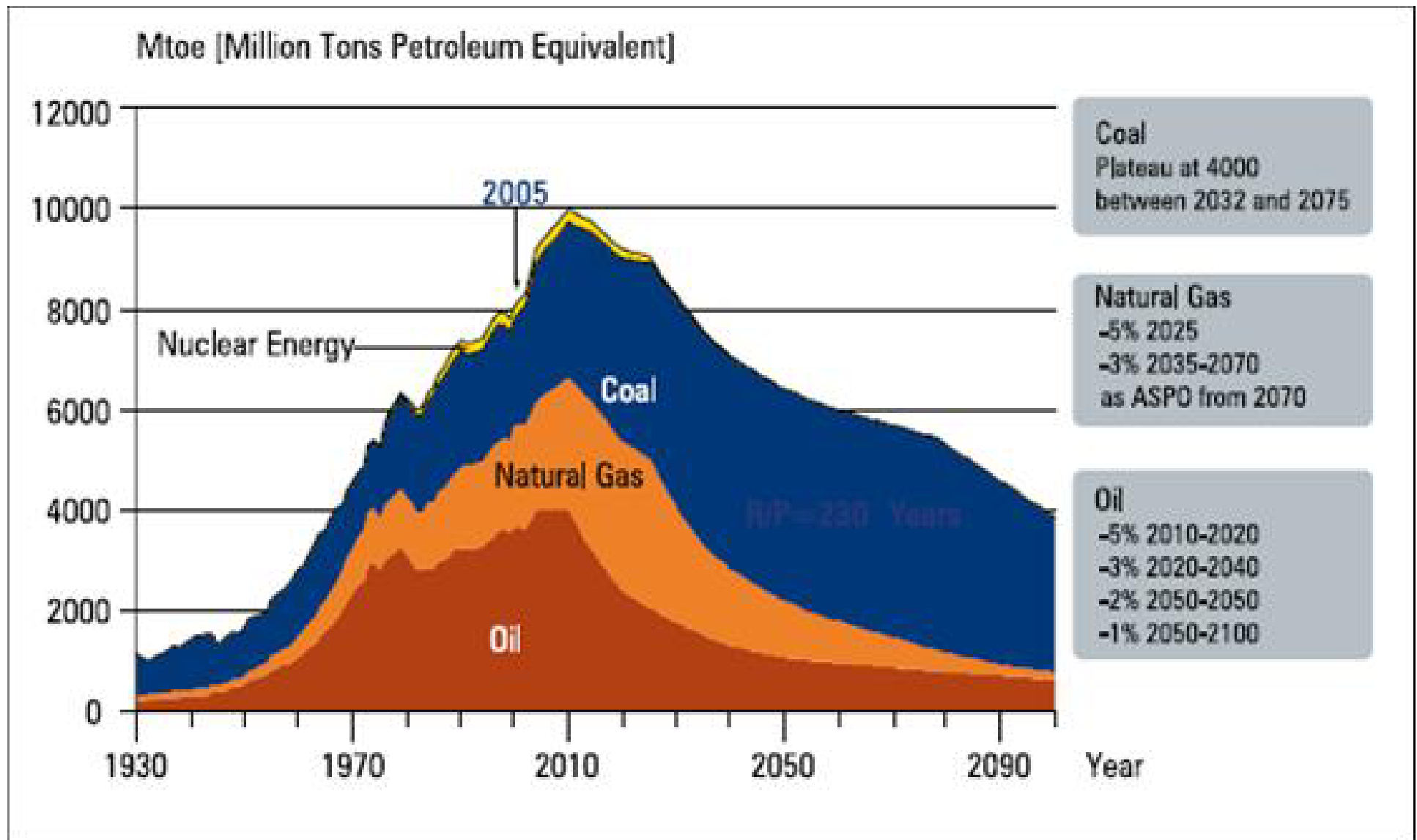
Intelligent Energy  Europe

**Lars Yde**

**Teknisk chef**

**HIRC**

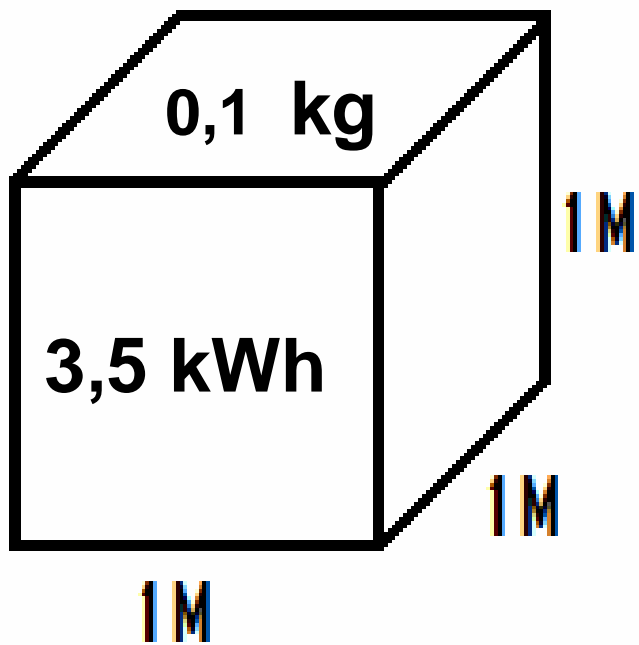




# BRINT



# Brint



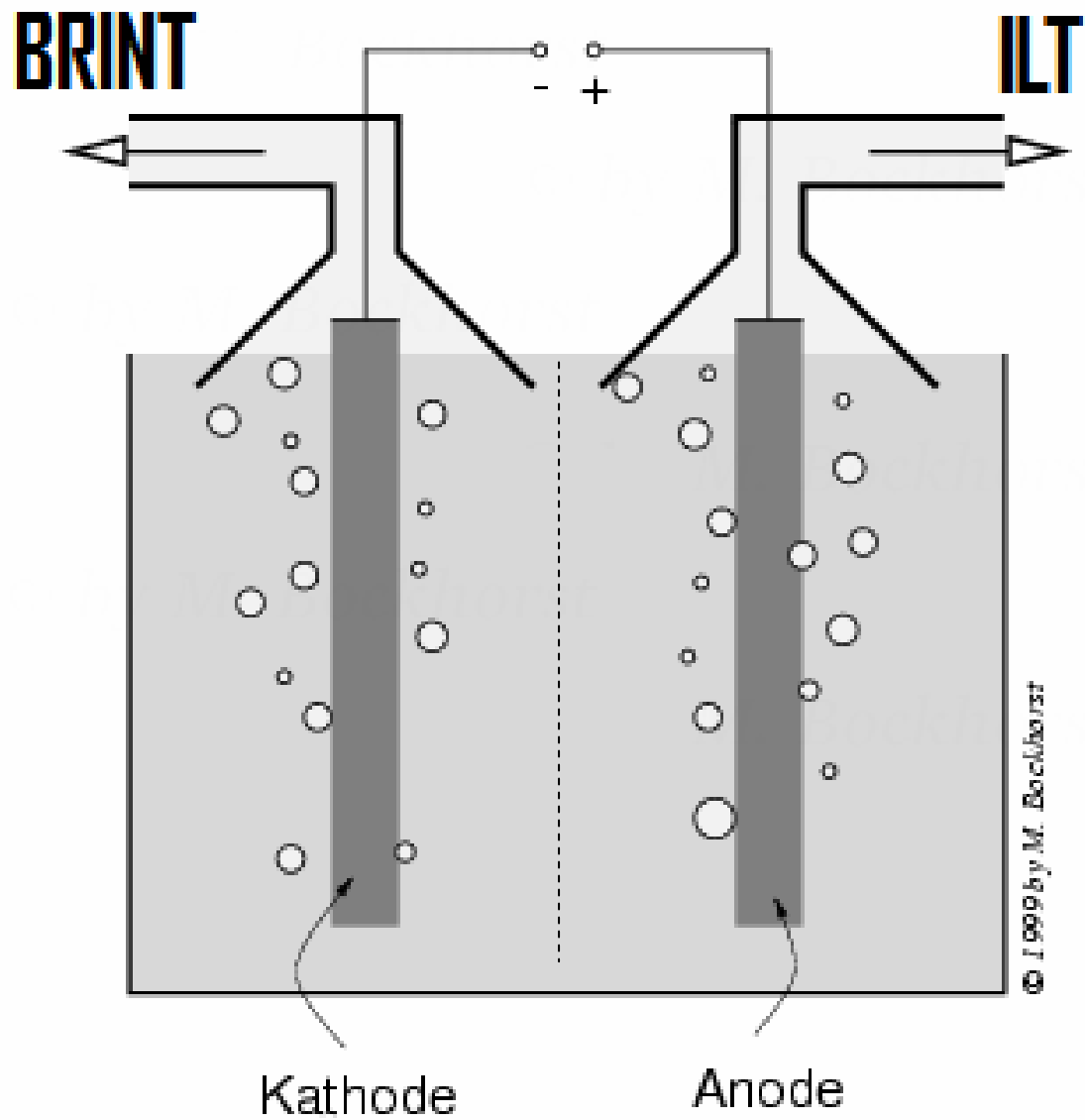
1 uge



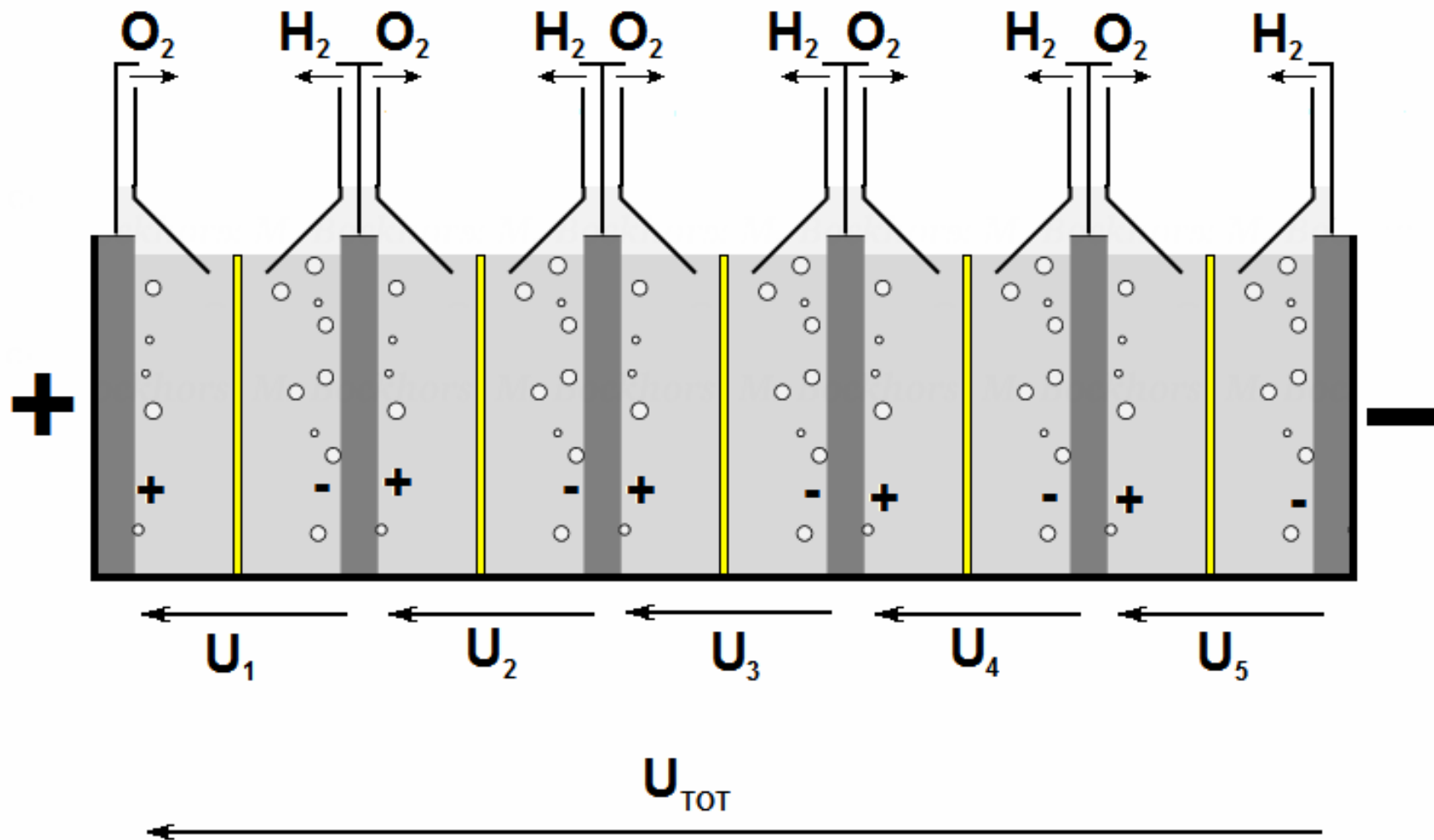
3,5 time



10 km

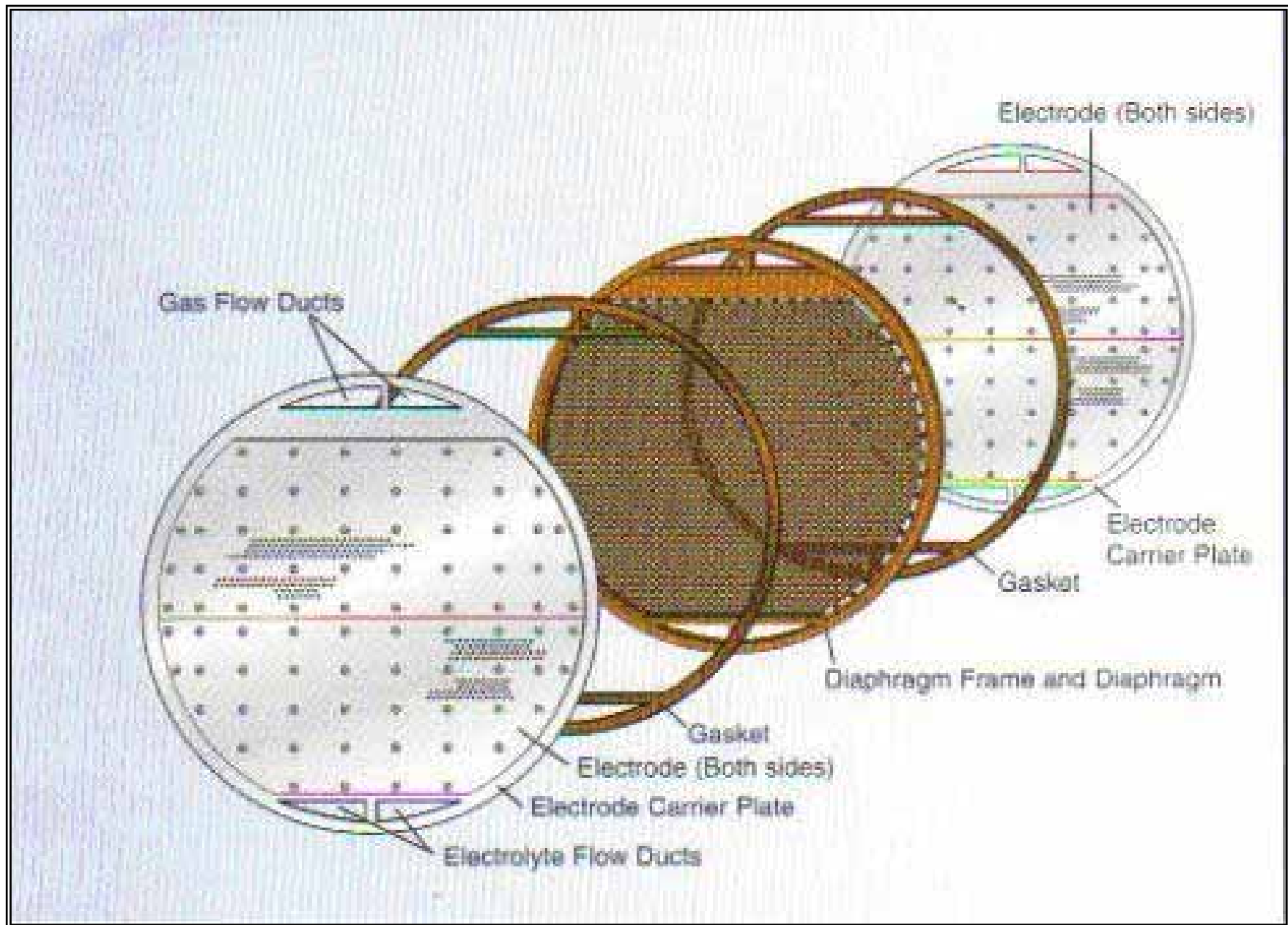


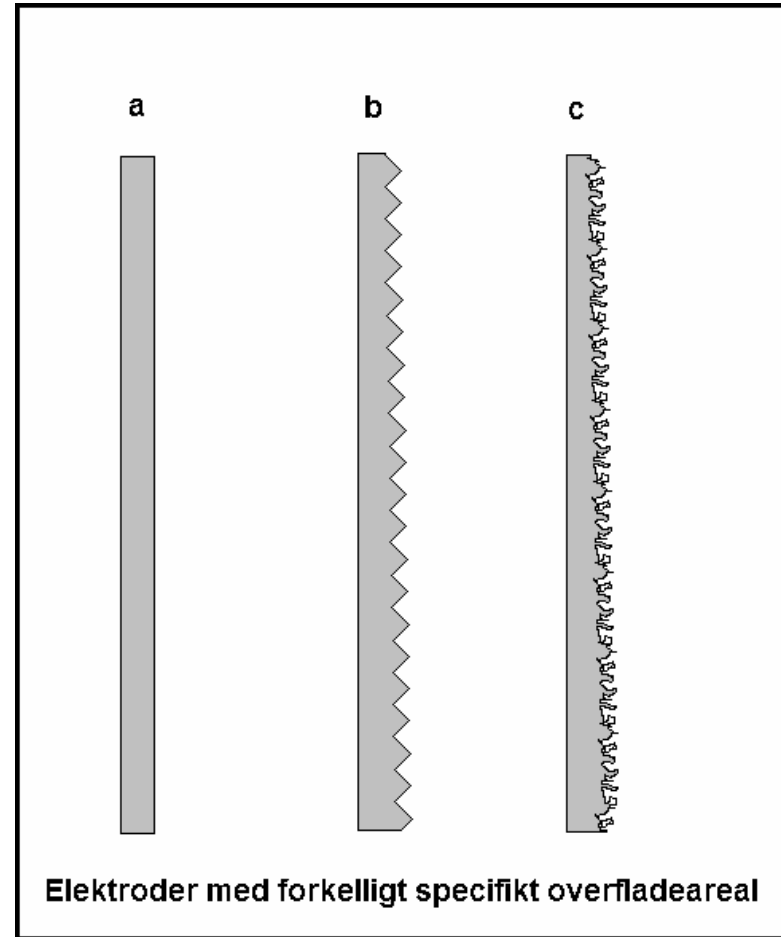
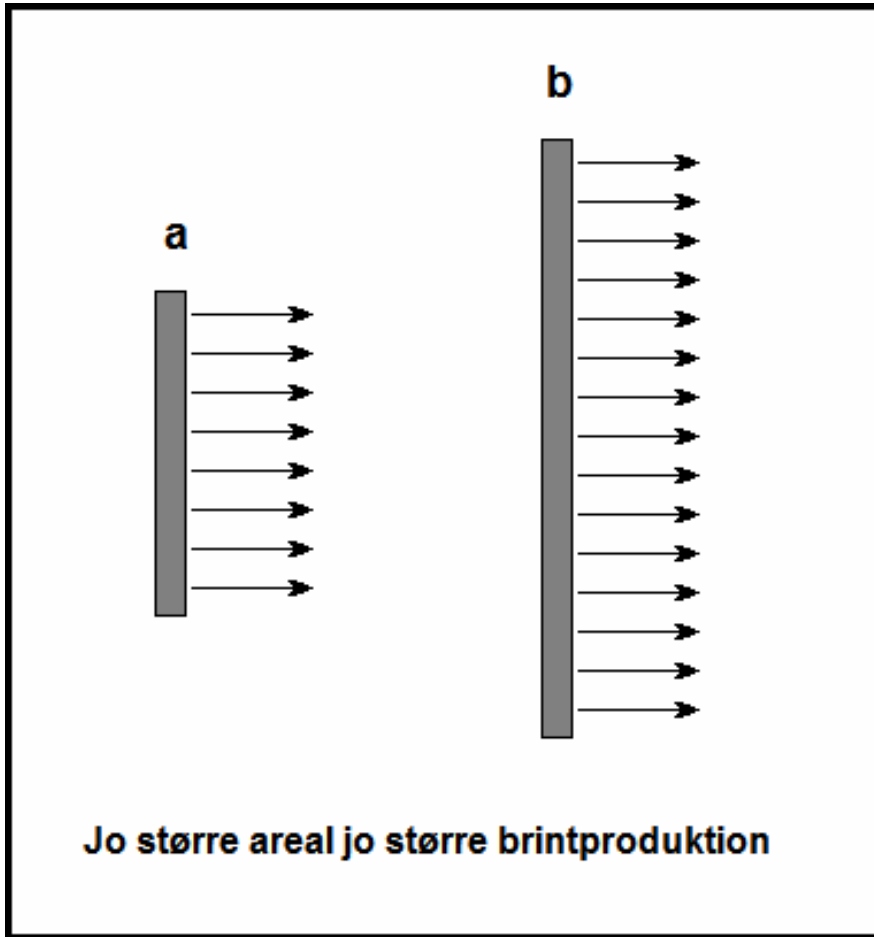
# Bipolær elektrolysør





Regional knowledge centre for hydrogen technology







Regional knowledge centre for hydrogen technology

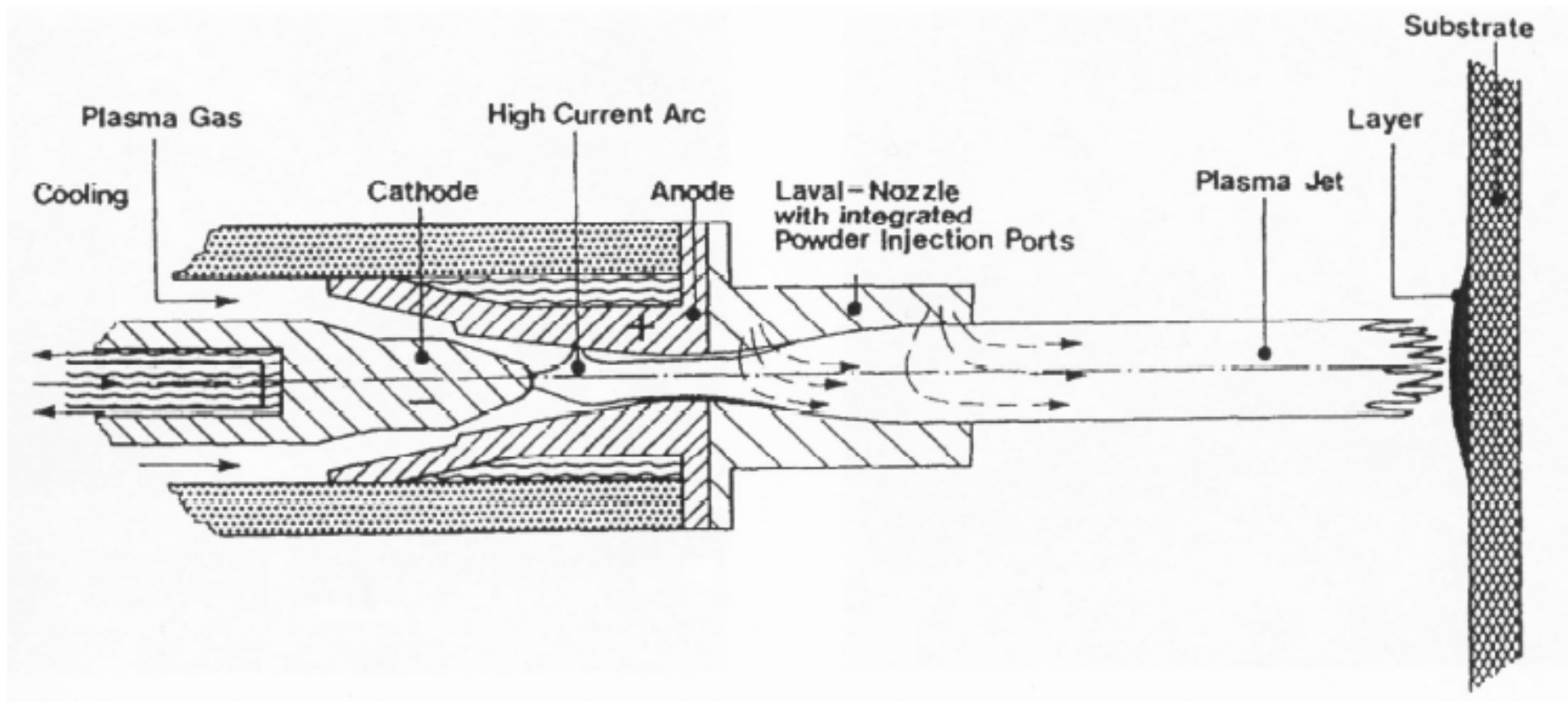
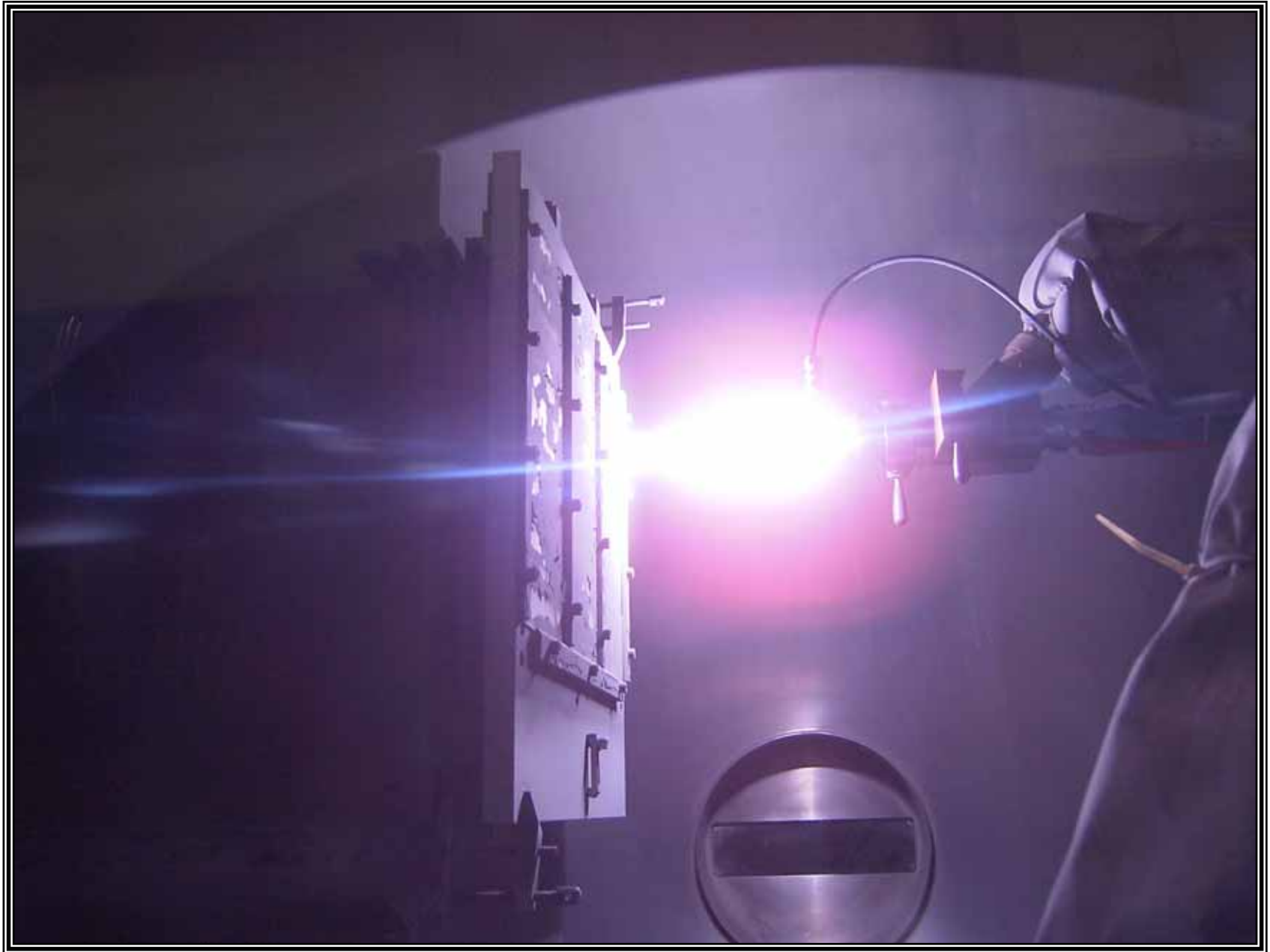


Figure 15: Principle of the DLR VPS torch with Laval nozzle

10.000 grader Celsius , 3000 m/s plasma jet, metalpulverhastighed 800 m/s



Regional knowledge centre for hydrogen technology

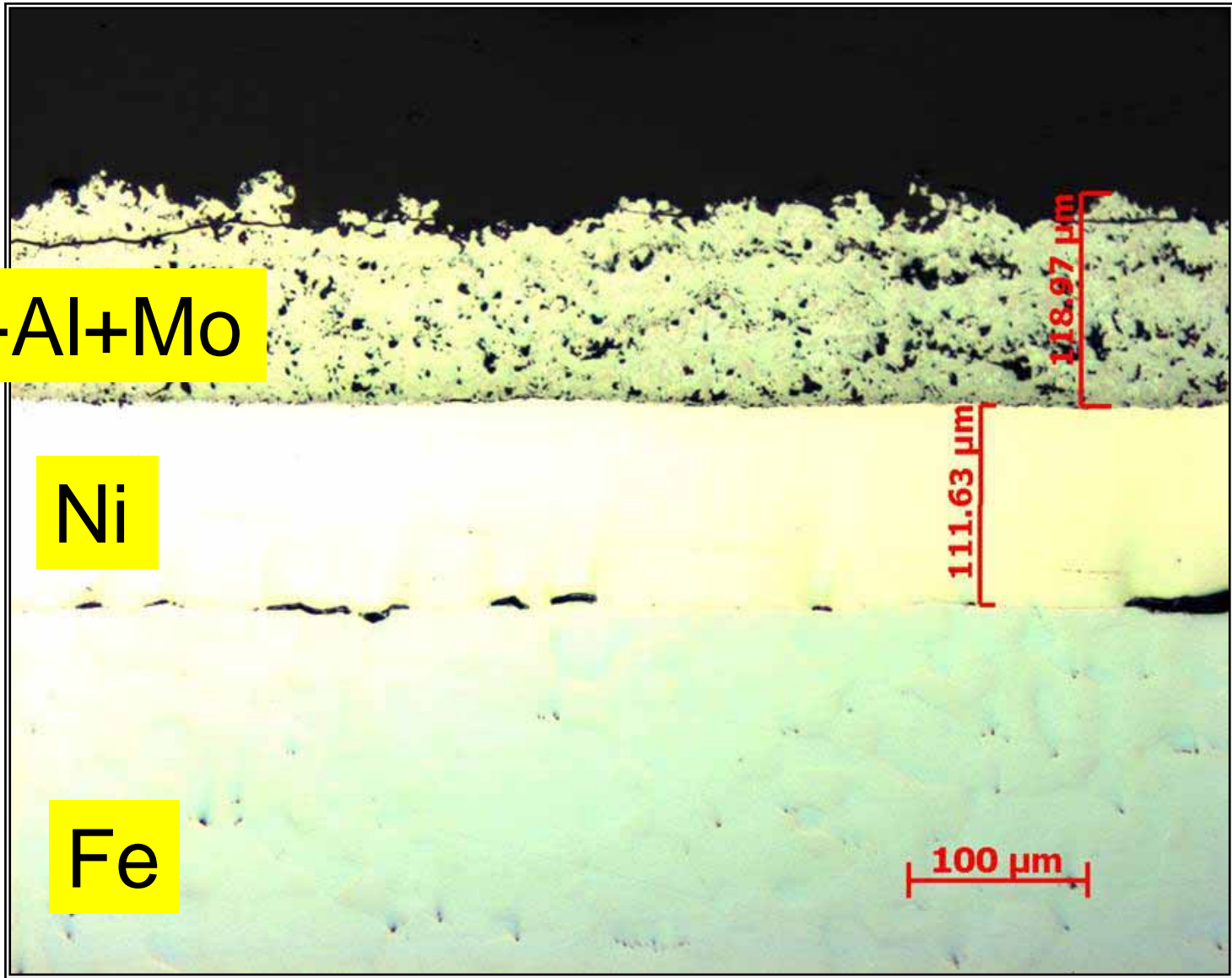


Regional knowledge centre for hydrogen technology



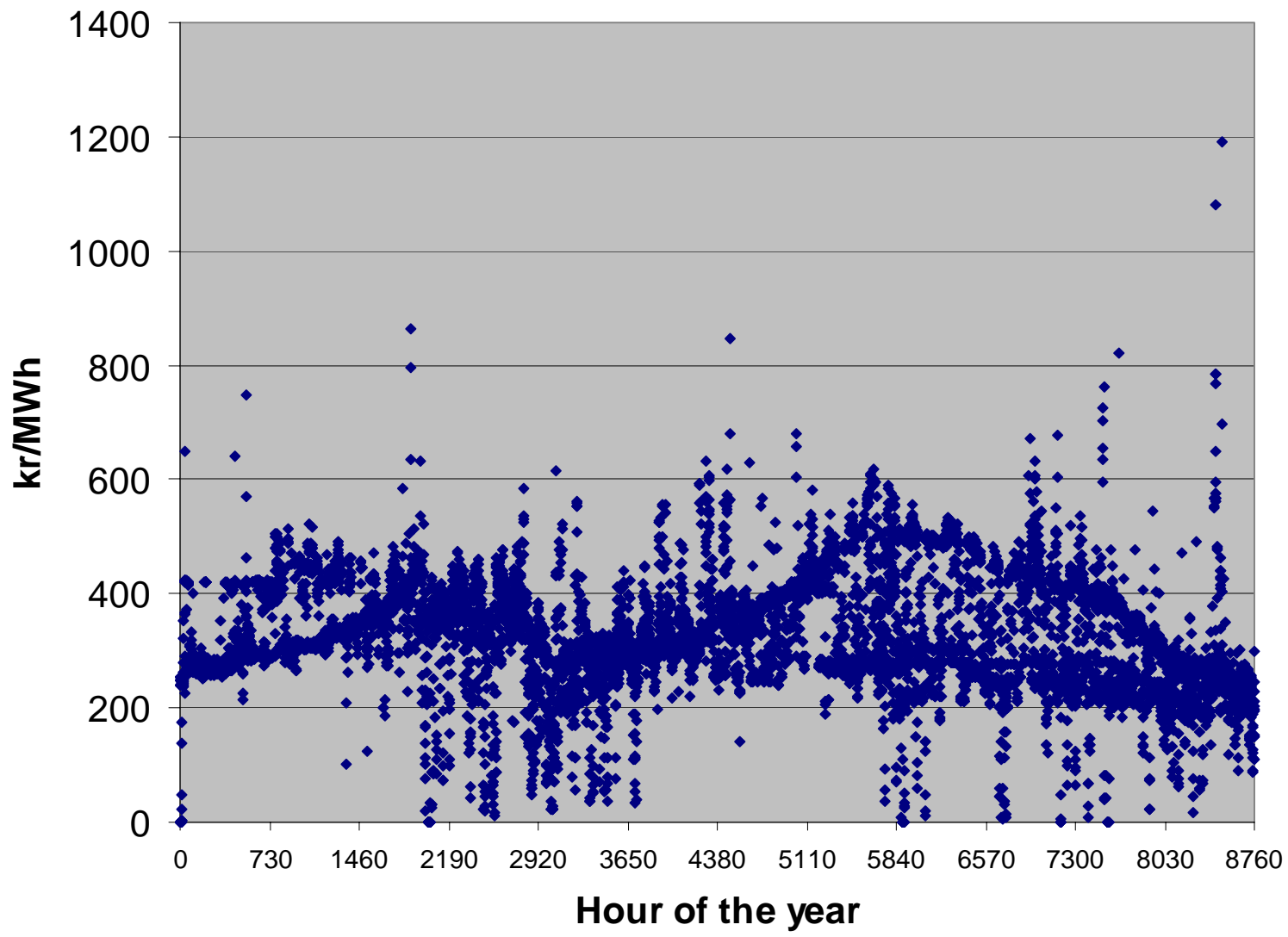
Regional knowledge centre for hydrogen technology

Ni+Al+Mo

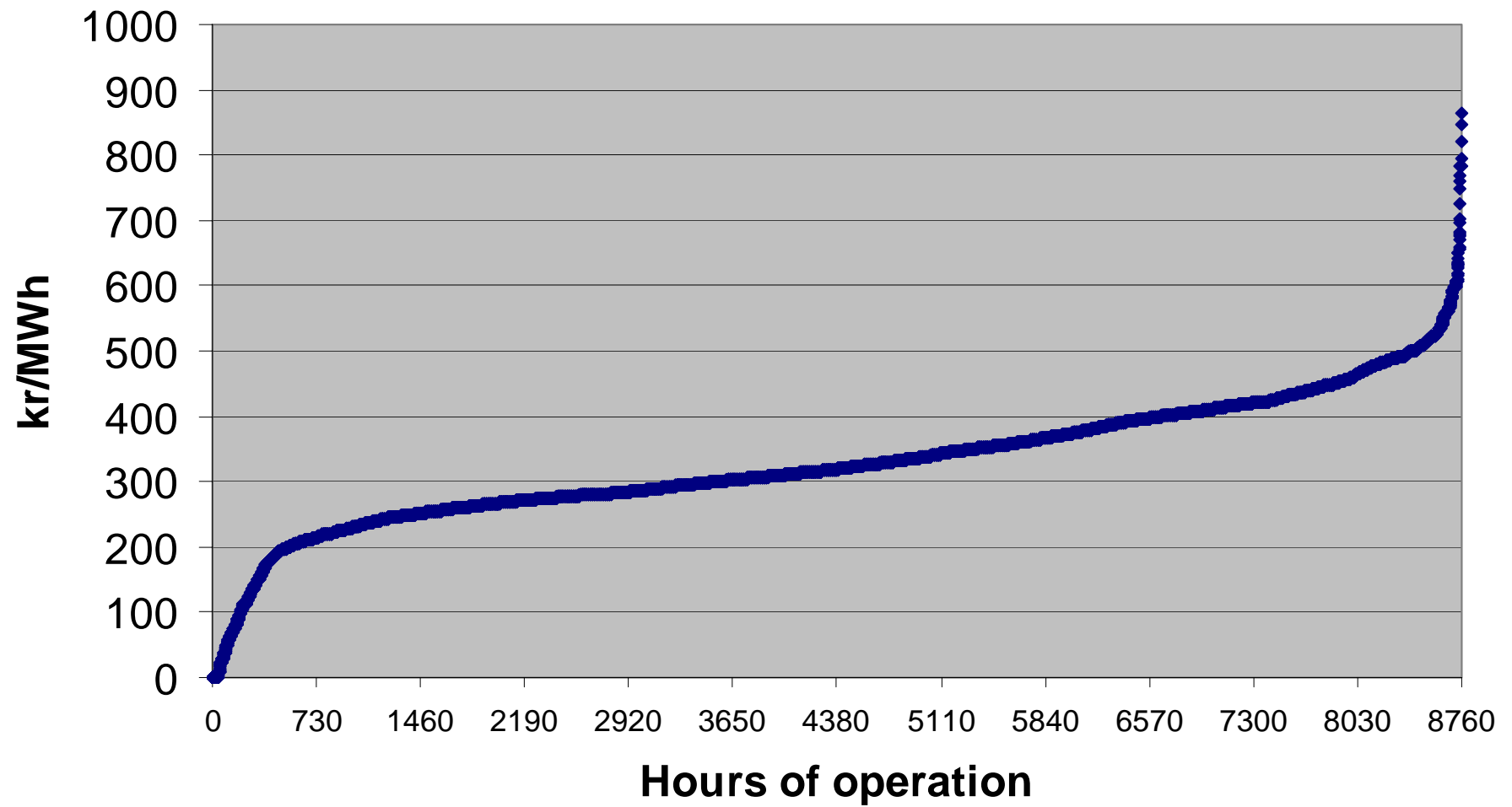


Side view of a plasma sprayed electrode

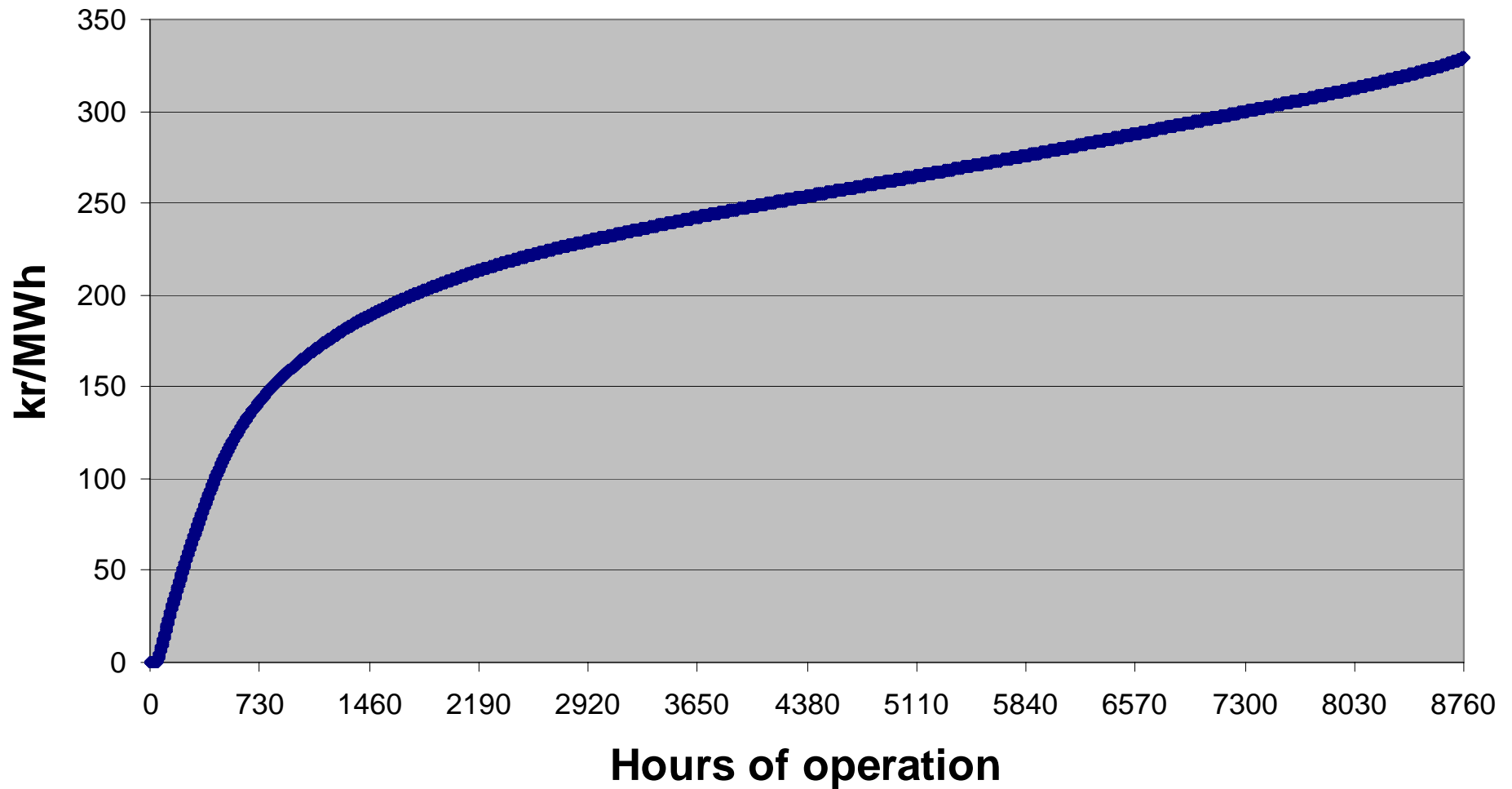
# Prices of electricity 2006



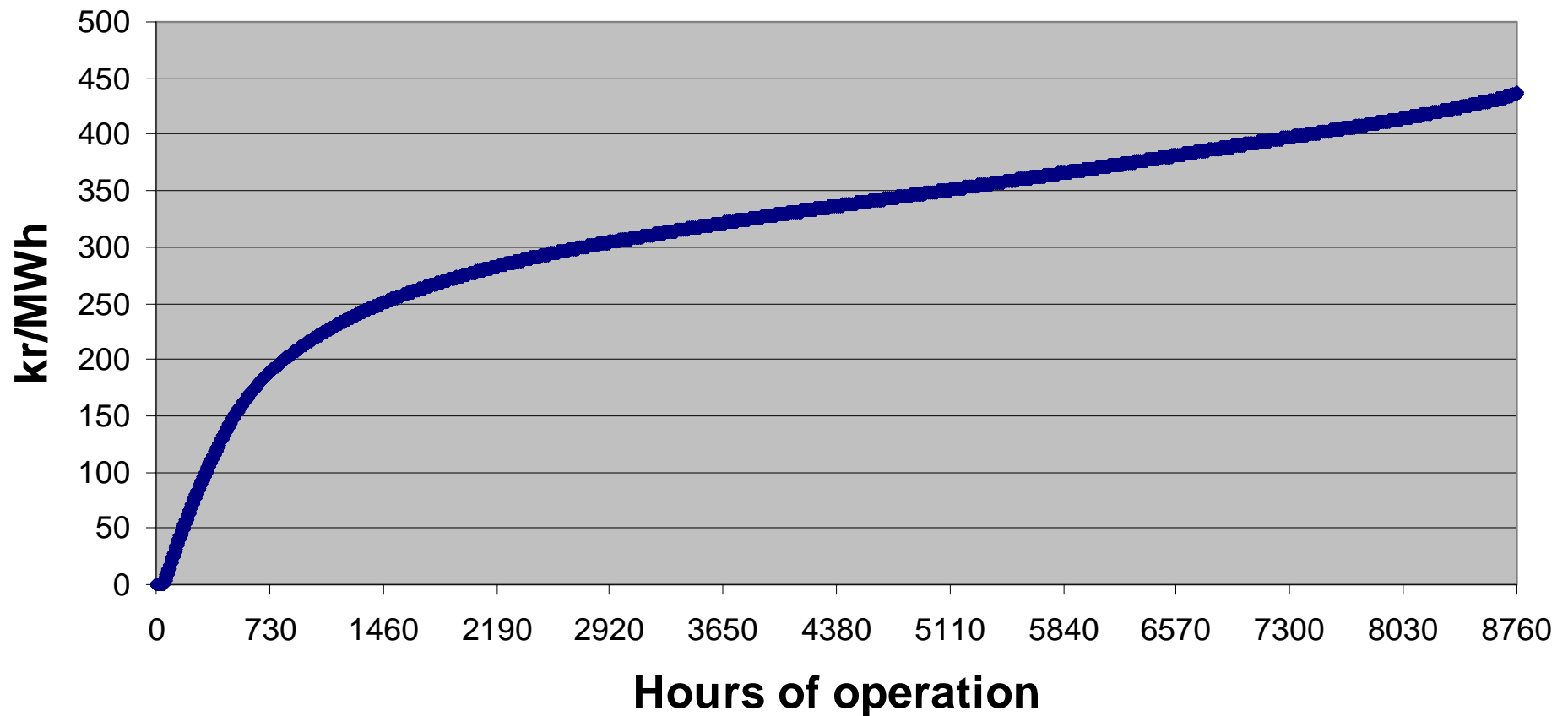
## Prices of Electricity 2006 in order



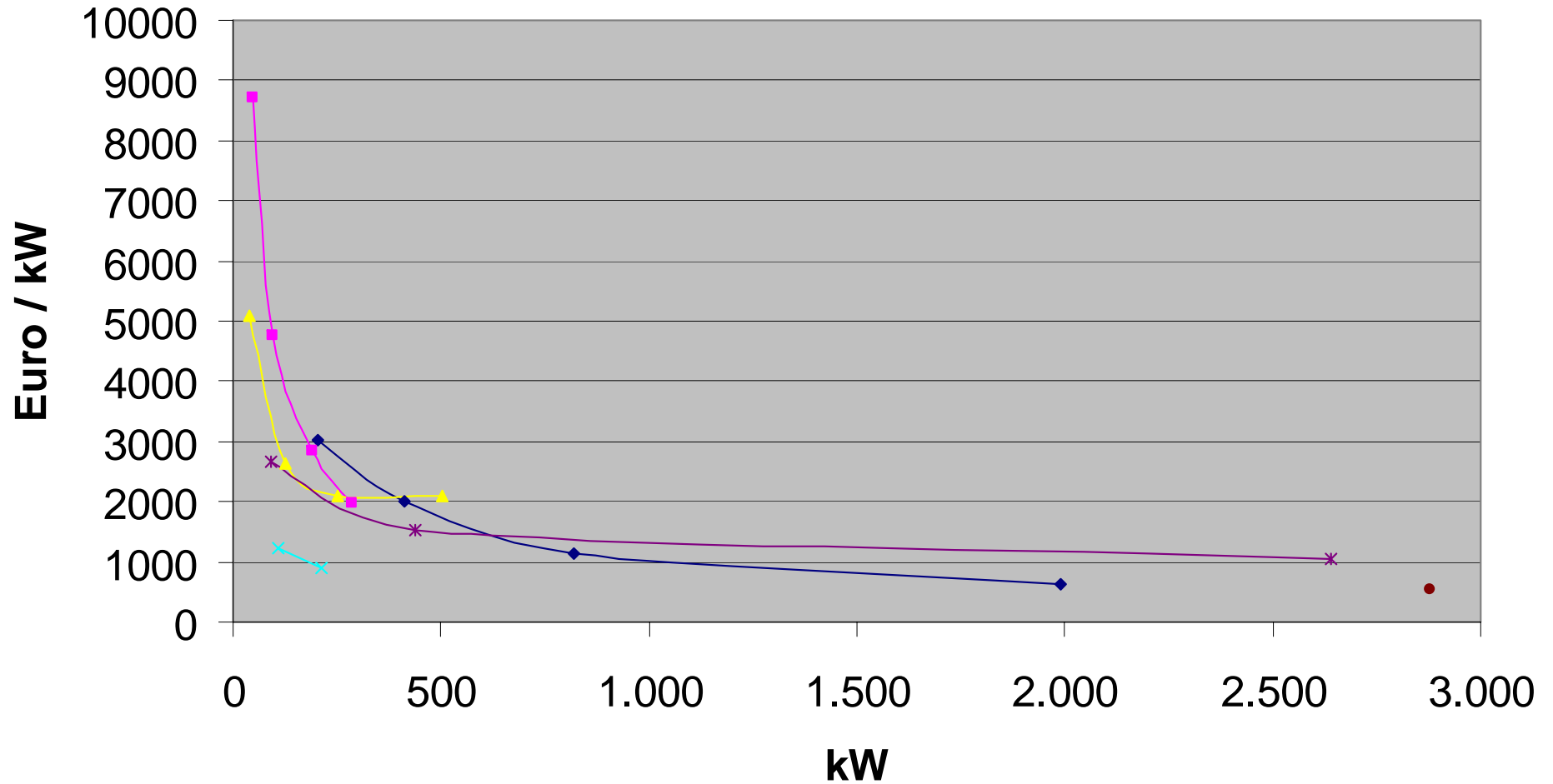
## Avarage Prices of electricity 2006 in order



# Prices of hydrogen 2006 (electrolyser efficiency 75%) excl. depreciation of the electrolyser



# Prices of Alkaline Electrolysers



◆ 1 Bar, HYDRO

■ 16 Bar, HYDRO

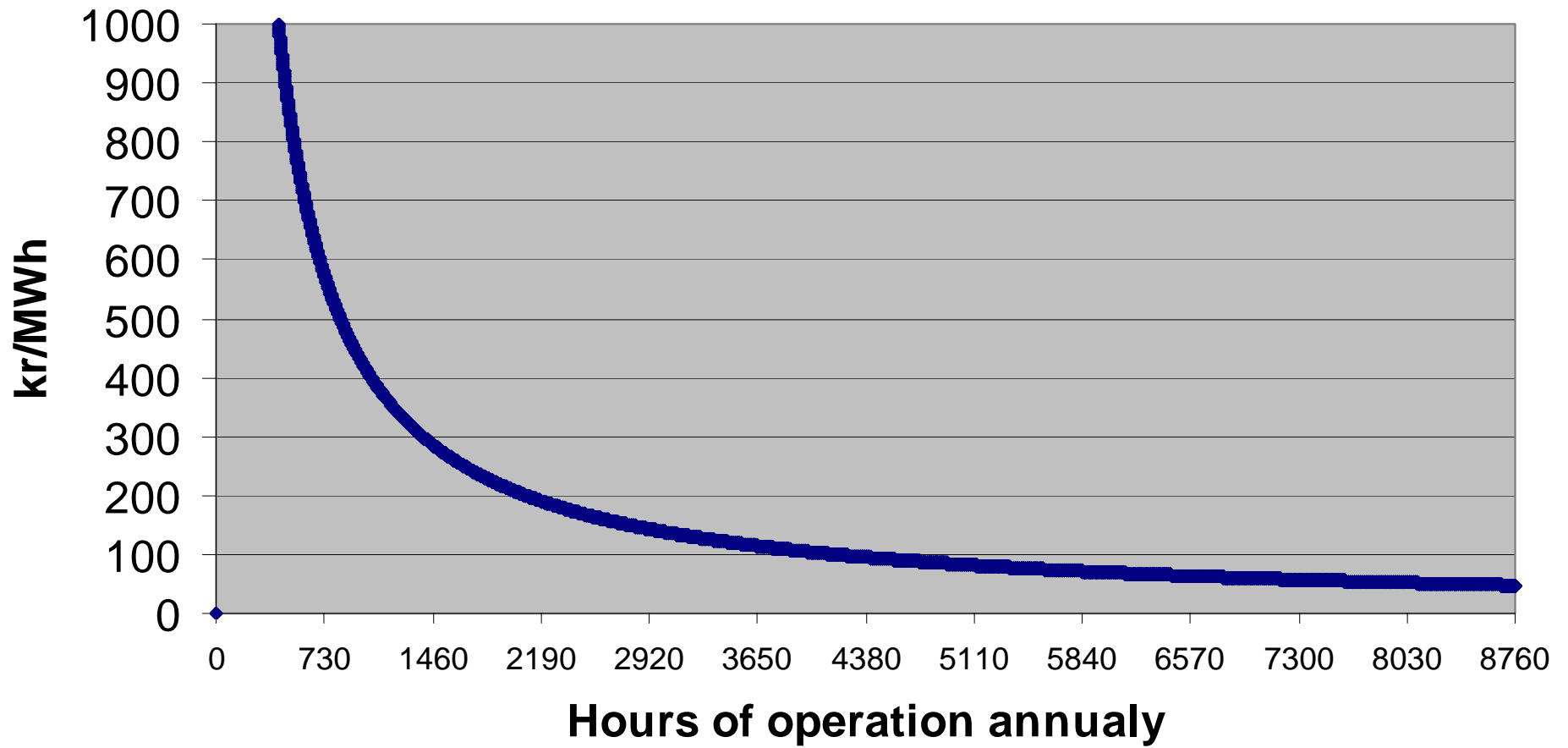
▲ 10 Bar, Hydrogenics

× 4 Bar, H2Industrial

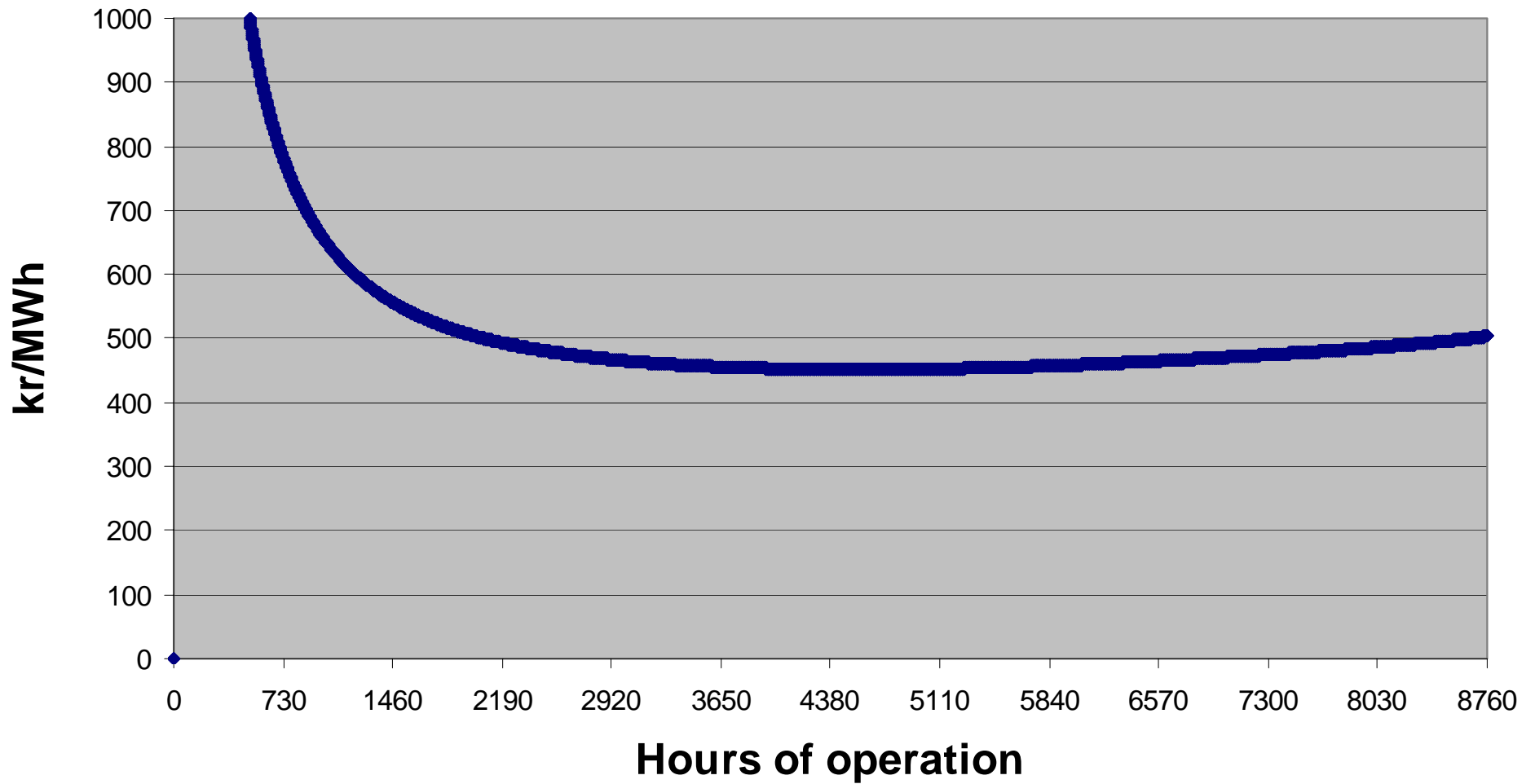
\* 6 Bar, AccaGen

● 1 Bar ELT

# Depreciation



## Prices of hydrogen 2006



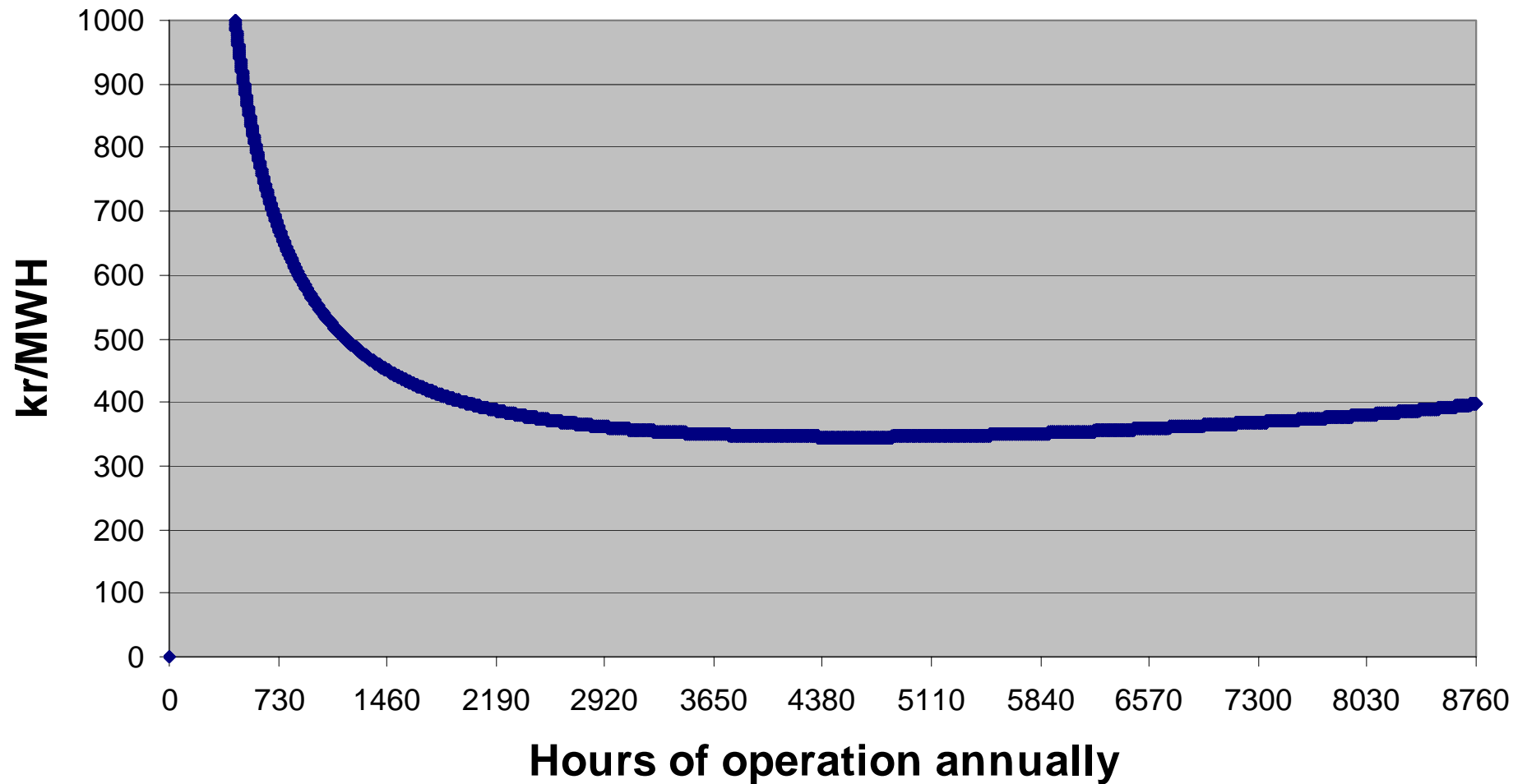
# Økonomisk optimering af brintproduktion ved elektrolyse

Anlægsstørrelse, Nm <sup>3</sup> /h:	620
Anlægspris, Kr.:	12.000.000
Effektivitet, kwh/Nm <sup>3</sup> DC:	4,64
Brændværdi for brint	3,5
Installeret effekt MW	2877
Antal driftår:	10
Driftudgifter, kr/kWh:	0,01
Vedligeholdelsesudgifter, Kr/kWh:	0,01

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Virkningsgrad ved brintproduktion	0,75
Varmeproduktion MW/MW	0,22
Varme pris kr/MWh	236,00
Varmesalg kr/MWh elforbrug	52
Iltproduktion NM <sup>3</sup> /MWh elforbrug	108
Iltpriis kr/NM <sup>3</sup>	0,50
Iltsalg kr/ MWh	54

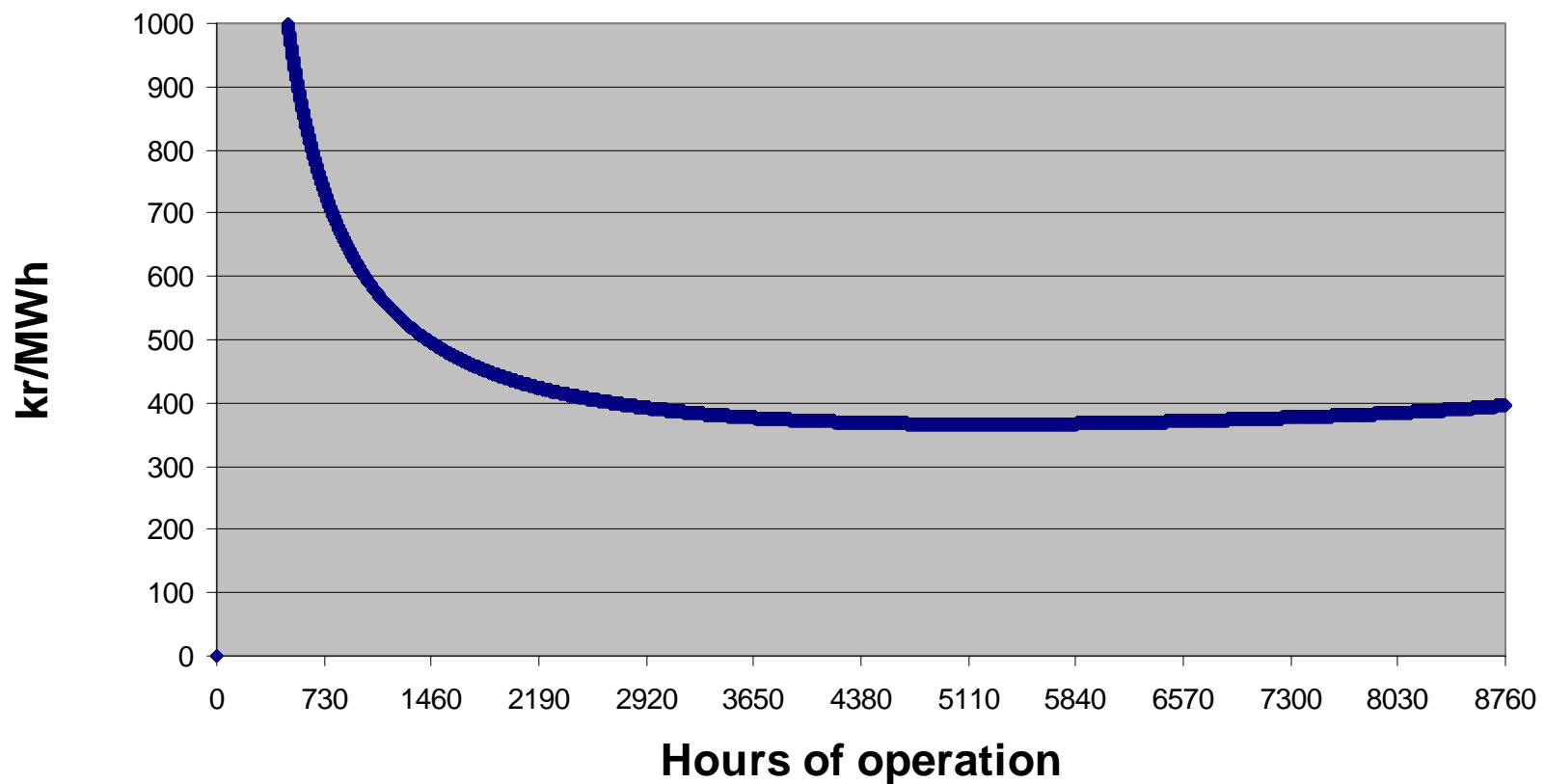
## Prices of hydrogen if oxygen and heat is sold



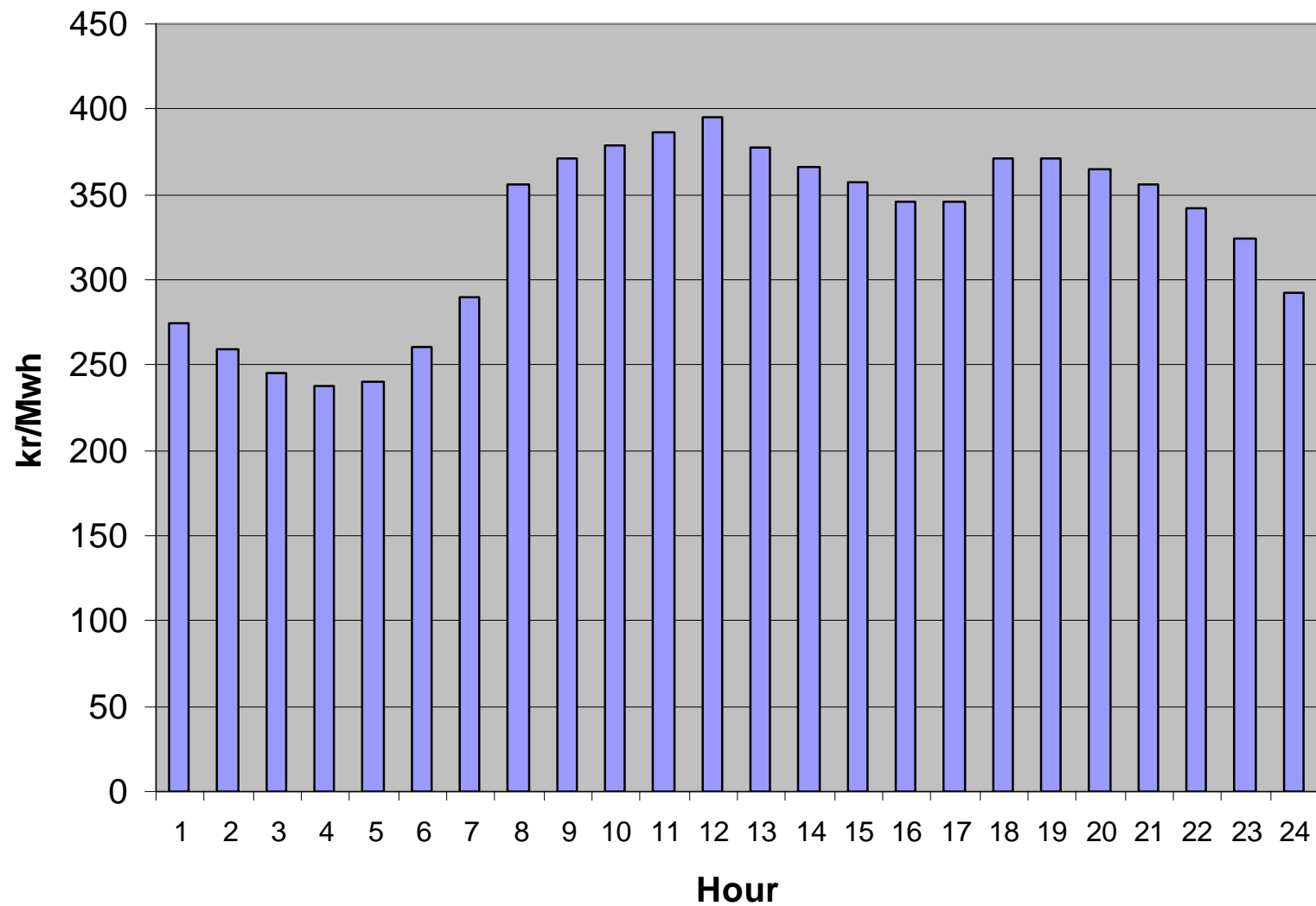
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## Prices of hydrogen 2006



## Daily average prices 2006



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