



# Hydrogen Europe

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## A 2x40 GW Green Hydrogen Initiative for a European Green Deal

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*The following presentation is the property of Hydrogen Europe and is not a part of Nel's official market analysis and company outlook*



# Hydrogen Europe: Pure Hydrogen Companies



## FCH techno providers and/or pure players

**H<sub>2</sub> Production & distribution**

We make it happen  
 ASAHI KASEI EUROPE  
 ANYTIME, ANYWHERE, ENERGY  
 HYDROGENICS  
 SHIFT POWER | ENERGIZE YOUR WORLD  
 IHT  
 ITM POWER  
 Energy Storage | Clean Fuel  
 nel  
 sunfire

McPhy  
 SIEMENS  
 John Cockerill  
 Lhyfe  
 thyssenkrupp  
 HDF

AirLiquide  
 Linde  
 WoiKoski  
 HYGEAR  
 hydrogenious  
 HyET Hydrogen  
 Advent  
 metacon  
 CLEAN ENERGY FOR INDEPENDENCE  
 Wystrachki  
 PITPOINT  
 CLEAN FUELS

INEA  
 HYSYTECH  
 Haskel  
 Swagelok  
 WORTHINGTON INDUSTRIES  
 Everfuel

**FC Transport**

BALLARD  
 elringklinger  
 FUEL CELL POWERTRAIN  
 HyMove  
 PM  
 PROTON MOTOR  
 Fuel Cells - Power-Systems  
 Mercedes-Benz FuelCell  
 POWERCELL  
 PLUG POWER  
 SYMBIO  
 FREUDENBERG  
 INNOVATING TOGETHER

MICHELIN  
 faurecia  
 OP  
 AFC Energy  
 CeresPower  
 Danish Power Systems  
 elcogen  
 GENCELL  
 SOLID POWER  
 Nedstack  
 SAINT-GOBAIN  
 ENGIE eps  
 IRD  
 M-FIELD  
 M-TSA  
 TECHNOPOWER

**Others**

Fronius  
 Hinicio  
 arcola energy  
 SEIYA consulting  
 CCS GLOBAL  
 Persee  
 EFCF  
 EUROPEAN FUEL CELL FORUM  
 TUV SUD  
 MAYFAIRMARINE  
 Sumitomo  
 Worley  
 energy | chemicals | resources

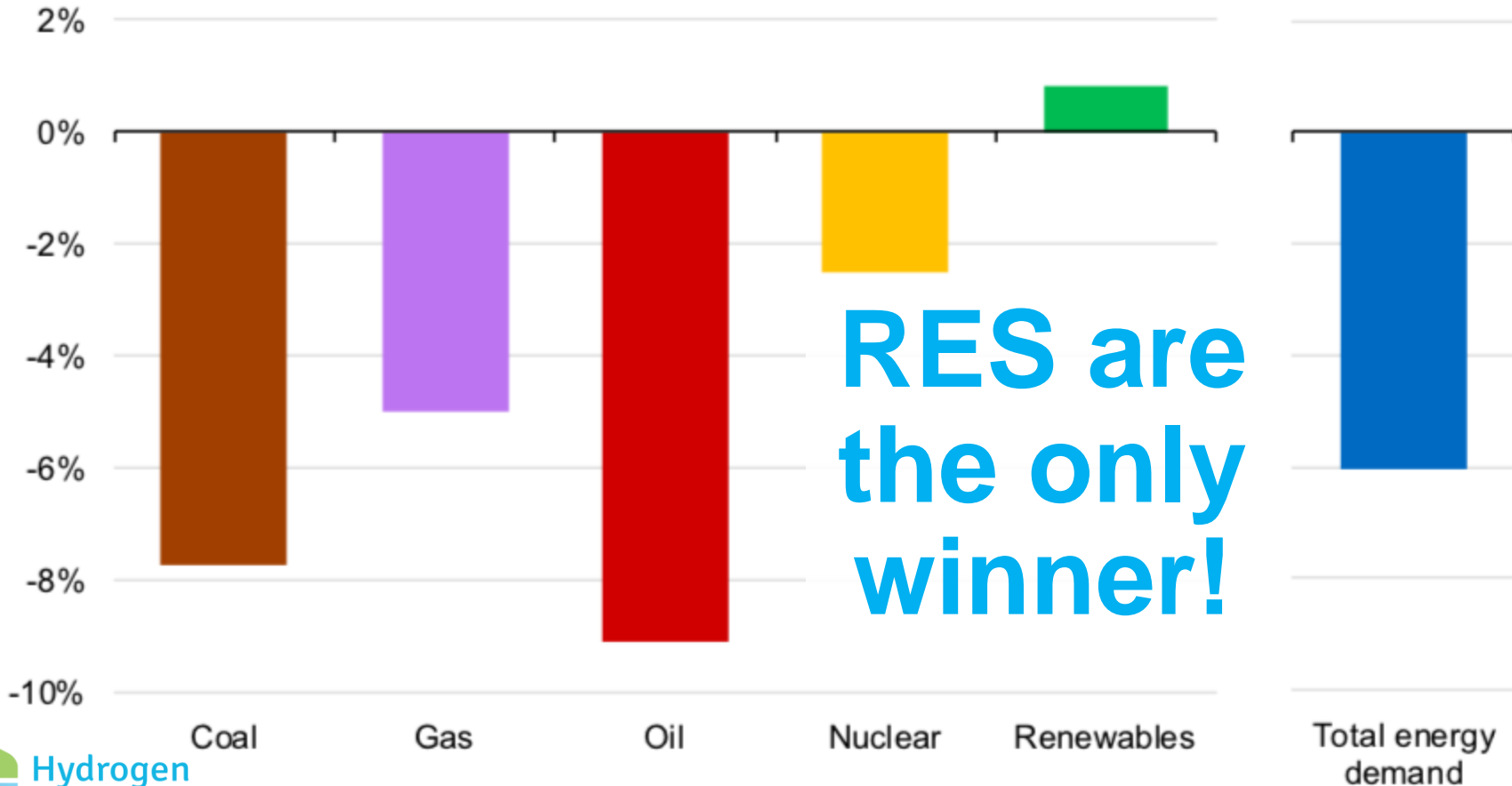
sfice  
 INNOVATIVE MINDS  
 kiwa  
 Horizon Educational  
 TOMO GROUP  
 JM  
 Johnson Matthey  
 Inspiring science, enhancing life  
 'TORAY'  
 Innovation by Chemistry  
 EMEC  
 umicore  
 H2energy

# Multitalent Hydrogen

“Missing Link”

1. Energy vector
2. Fuel
3. Chemical feedstock

## Projected change in primary energy demand by fuel in 2020 relative to 2019



**RES are  
the only  
winner!**





**Corona imposes economic recovery.**

# European Green Deal



## Corona- Climate- Contract

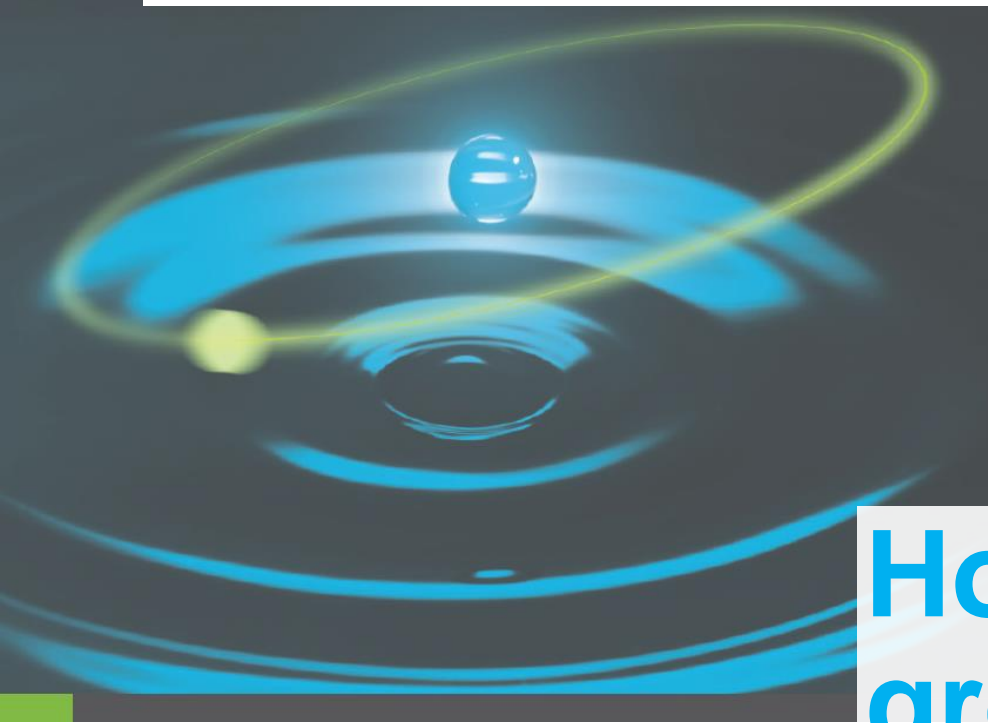


**Climate protection remains a  
major challenge.**

# The European Green Deal



Mr Green Deal  
**Frans  
Timmermans**



## Green Hydrogen for a European Green Deal A 2x40 GW Initiative

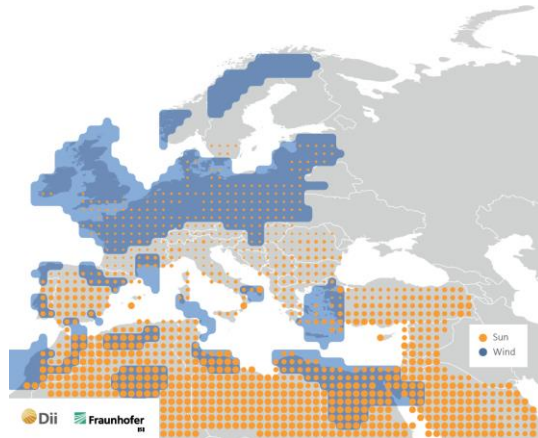
Prof. Dr. Ad van Wijk  
Jorgo Chatzimarkakis

# How to scale up green hydrogen?



# Unique opportunity to develop green hydrogen

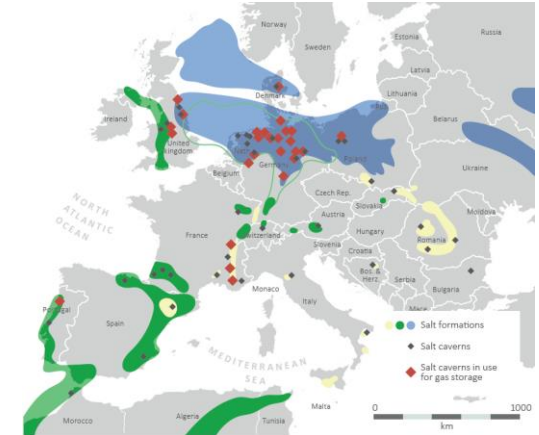
## Solar/wind resources



## Hydrogen backbone



## Salt Caverns



Investments in EU	Investments Billion €
Electrolysers	13,7
Offshore Wind	44,7
Onshore Wind	23,4
Solar PV	14,2
<b>TOTAL</b>	<b>96,0</b>

Investments in Ukraine and North-Africa	Investments Billion €
Electrolysers	13,5
Solar CSP	39,4
Onshore Wind	24,6
Solar PV	14,0
<b>TOTAL</b>	<b>91,5</b>

**170.000 Jobs in electrolyser manufacturing**

# Investments happen now!



4 GW in 2030  
10 GW in 2040  
800.000 t of H<sub>2</sub>/y

## NorthH<sub>2</sub>



Samen naar groene waterstof

# HydroGenewables

## Heart of the Green Deal



**Fatih Birol** ✓  
@IEABirol

Lithium-ion batteries & hydrogen electrolyzers are ready for the BIG time. They have many things in common & are well suited to mass manufacturing.

Putting them in recovery plans can push their costs down & make them cornerstones of modern energy systems:

[iea.li/2z7gh1b](https://www.iea.li/2z7gh1b)







**Shift happens  
– Now!**