

## Nous combustibles renovables

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Quins vehicles hi haurà en el futur????

Quina serà la font energètica?



**Una complexa decisió subjecta a algunes incerteses tècniques, disponibilitat d'infraestructures, costos energia, costos vehicles, interessos empresarials...**



**Com esbrinar sobre el futur en aquest tema??**

**S'està  
davant  
de  
canvis  
totals  
davants  
de  
canvis  
radicals  
com a  
principi  
del  
segle  
XX**



motor de combustió interna, ICE  
o motor elèctric?

Què farà la  
indústria l'any  
2035???

**Green DEAL  
RePower EU**

versus

***noves propostes  
de combustibles  
renovables ???***

***NO EMISSIONS DE CO, No Fòssils***

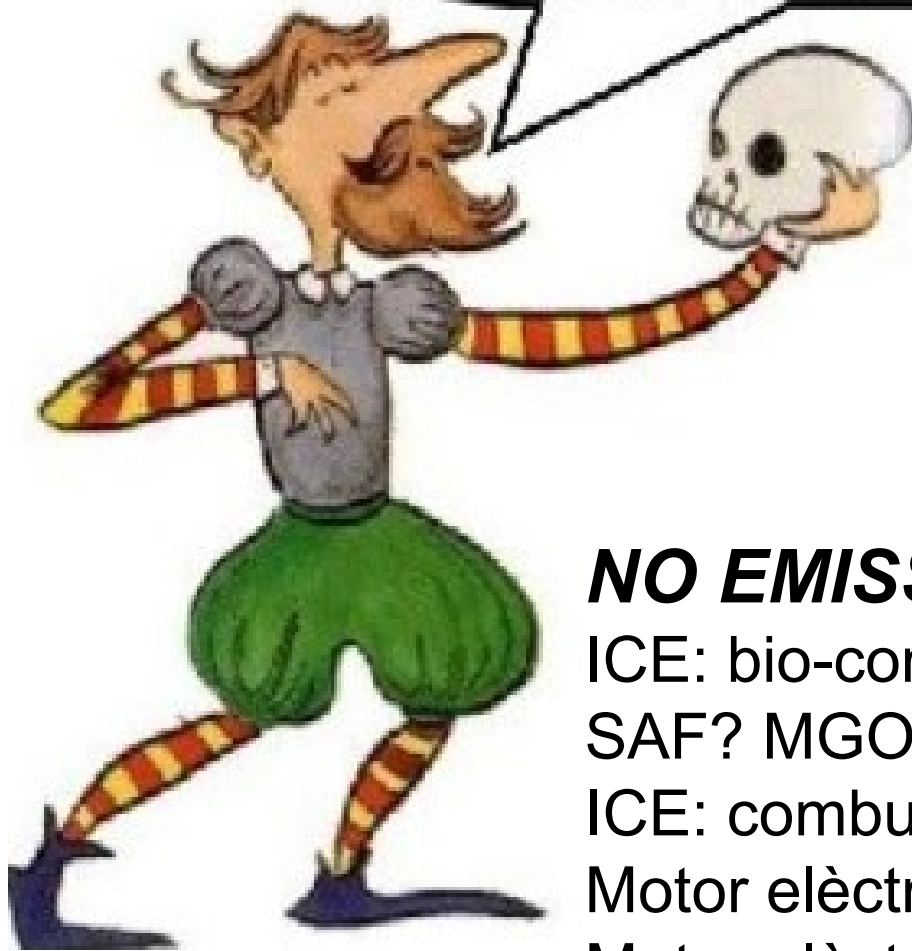
ICE: bio-combustibles? Biometà? HVO?

SAF? MGO?

ICE: combustibles sintètics (carboni neutre)

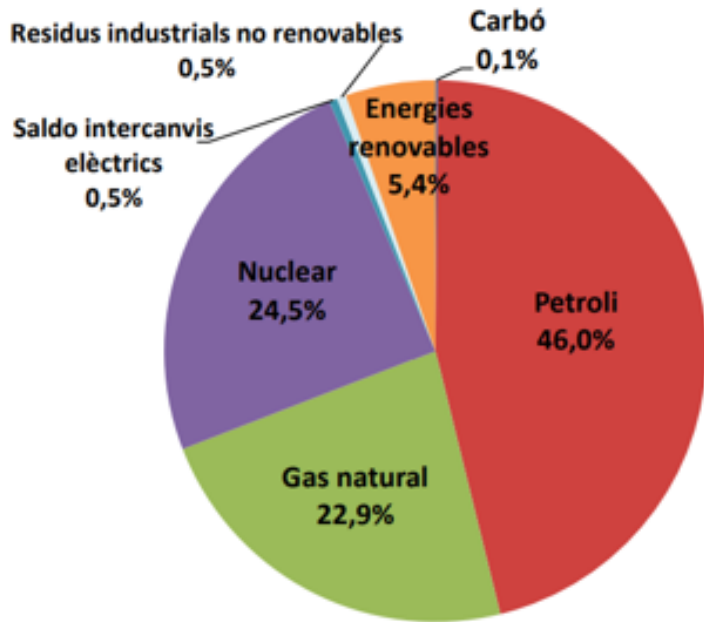
Motor elèctric: Bateria

Motor elèctric; Hidrogen



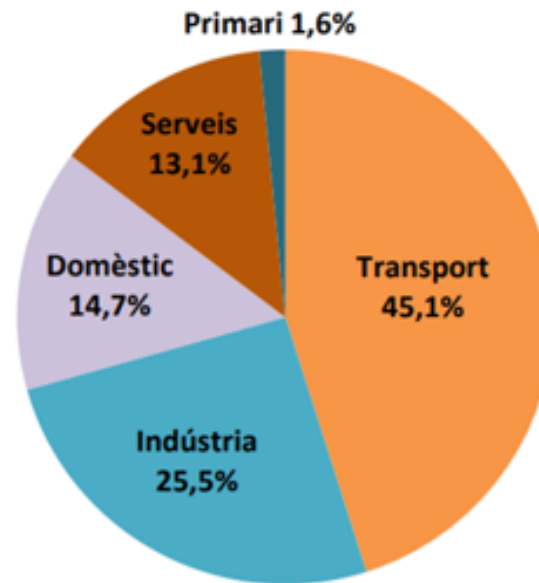
# ¿Quina es la magnitud del problema? (90TWh)? Catalunya

2019



Primary energy consumed in Catalonia classified by energy source.

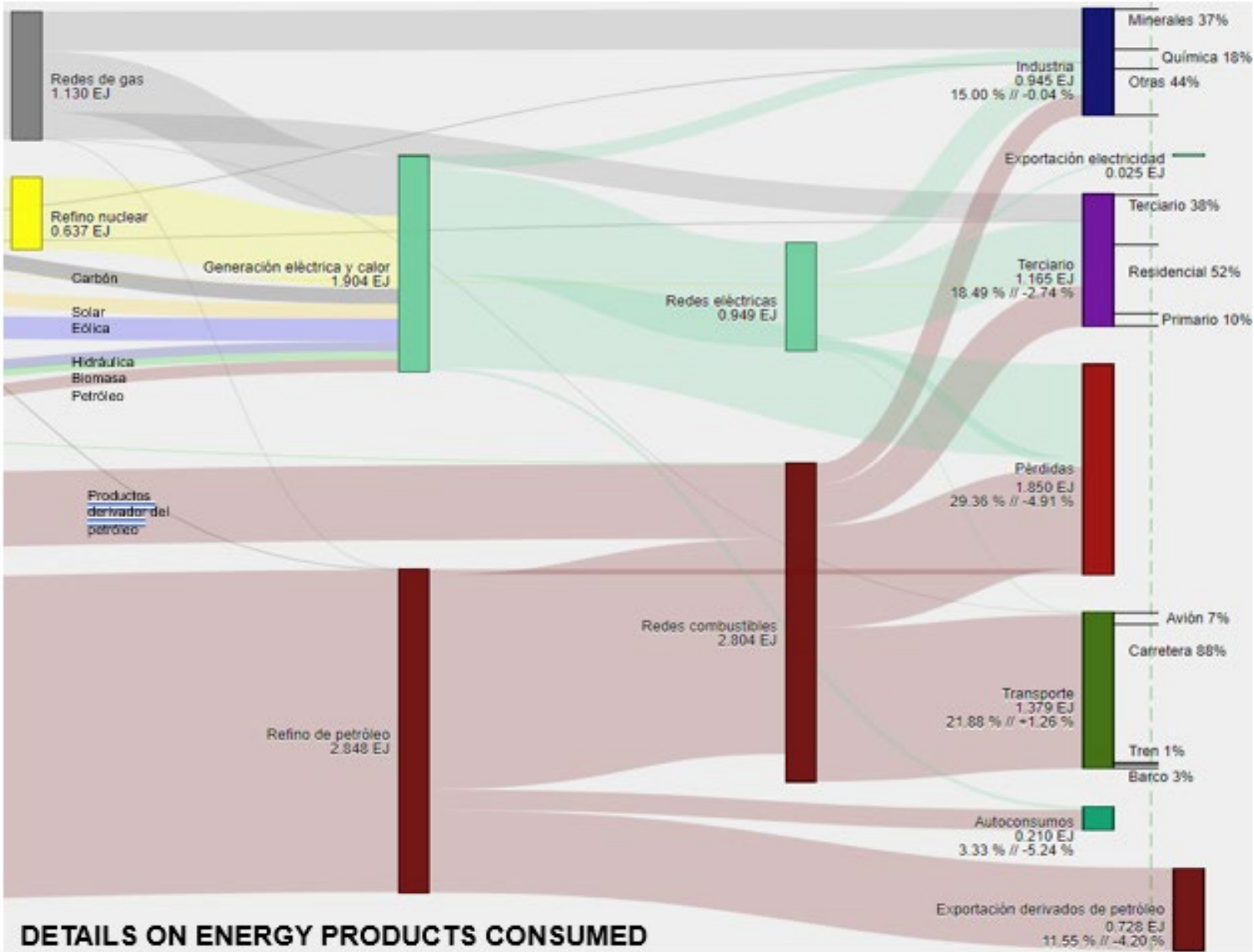
Fossil + nuclear



Final consumed energy.

Transport + industry

Generalitat de Catalunya  
Institut Català d'Energia

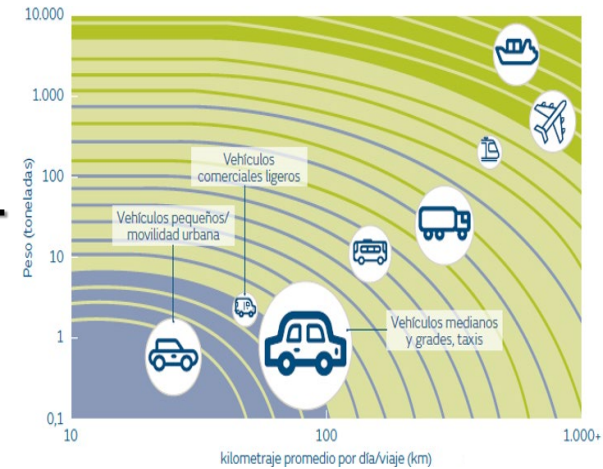


Espanya  
 370TWh  
 38% de tot  
 el petroli i  
 productes  
 derivats  
 utilitzats  
 com  
 energia  
 primaria  
 (>30M mt)

# NO FOSSILS → DEFOSSILIZATION



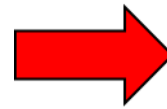
## TRANSPORT



Petroquímica sense fòssils??????  
Industria en reconversió???

**Necessitat d'una nova química sostenible.**

H2 verd  
Carbonis verd o neutres



Hidrocarburs sintètics  
(bio, neutres)

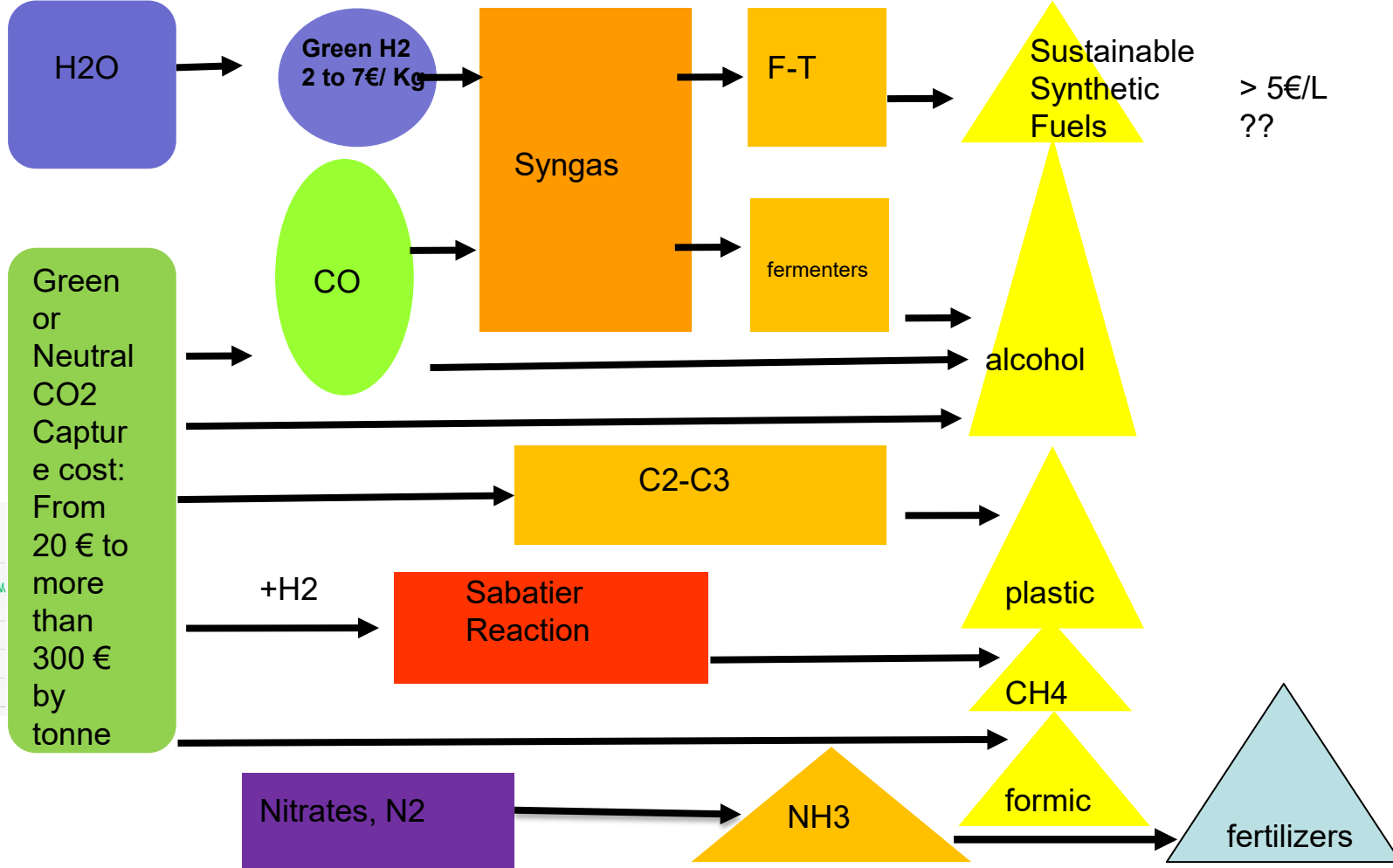
<https://www.sasol.com/media-centre/media-releases/sasol-produces-15-billion-barrels-synthetic-fuel-coal-fifty-years>

2<sup>a</sup> World war, synthetic gasoline, SASOL South Africa

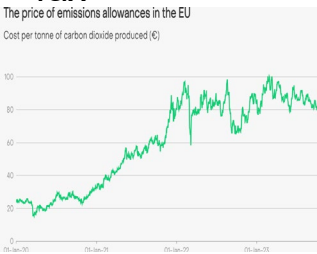
150 000 barrels of liquid fuel per day CTL.

GREEN HYDROGEN + GREEN / NEUTRAL CARBONS for producing **SUSTAINABLE CARBON CHEMISTRY**

challenges



CO2 emission Tax



Green or Neutral CO2 Capture cost: From 20 € to more than 300 € by tonne

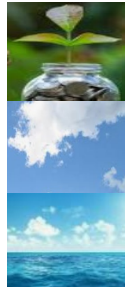




# USE GREEN OR NEUTRAL CARBONS



+



Green Carbon's  
biogenic origin

DAC direct air  
carbon capture

DOC direct ocean  
carbon capture

Renewable  
fuels and  
chemicals

Renewable-  
driven circular  
economy



Cost of the  
Carbon  
Capture???

1 tona de CO2 >> 150€

## Light duty vehicle.

# Challenge

Deployment:  
transport



65% efficiency in transport.  
0.8 Kg of hydrogen are needed in a Toyota Mirai to travel approximately 100 km.  
7-8 Kg of hydrogen for a 40 tons truck

## Heavy duty vehicle !!!!



H2 Less efficiency that electric battery vehicles

Electricity to Battery + Battery to Electric Motor  
Efficiency > 81%

Electricity to Hydrogen and Hydrogen to Electric Motor  
Efficiency >33%

Combustion Engine  
Efficiency 27%+ CO2 emissions

Gasolina 5M mt **ES**

Diesel 22M mt **ES**

HVO(2021) **EU**

3,5M mt

Capacitats **EU** X3

Synthetic fuels  
Efficiency < 20%  
Cost too high



Biofuels , HVO  
No zero CO2,  
efficiency < 25-30%



Indes de cetà

Deployment of infrastructures  
Mass production of fuel cell vehicles



Infrastructures?

Potències:  
50kW  
300kW, 500kW  
>700kW







Costos ¿?  
 Vehicles  
 Infraestructures  
 declaració  
 empremta de  
 carboni

	dièsel	CNG,GLP	Bio combustibles	Combustibles sintètics	Elèctric bateria	Electric Pila combustible H2
motocicleta			o	o	X	
Cotxe urbà			o	o	X	?
furgoneta			o	o	X	o,?
autobús			o	o	X	X
autocar			o	o	X	X
camions			o	o	-	X
vaixells			X	X	X	X
avions			X	X	-	?



Shaping Energy for a Sustainable Future



**Investments & Infrastructure ARE NEEDED** for a useful deployment of technologies suitable for replacing fossil energy source or “black carbons”

Questions?



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