ALICE-HYDROGEN EUROPE COLLABORATION LAUNCH EVENT

Joining forces to help decarbonise road transport logistics

4th March

09.00 to 11.00 CET

alice | Alliance for Logistics Innovation through Collaboration in Europe

Hydrogen Europe

Jorgo Chatzimarkakis
Secretary-General of Hydrogen Europe

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Hydrogen Europe

How can the role of H2 trucks be stepped up on the EU's political agenda?

Hydrogen fuel cell trucks: paving the road to a carbon-neutral Europe, 5th March 2020

Hydrogen Europe

Joint call for the deployment of hydrogen fuel cell trucks

A needed shift towards a carbon-neutral society

Hydrogen is particularly suitable for long-haul trucks of over 16 t. For long-distance, hydrogen is expected to represent the most promising carbon-neutral solution. Hydrogen can also be a suitable solution for **regional distribution and other applications requiring high energy use** (e.g. refrigerated/garbage trucks).

We aim to make **large-scale deployments of fuel cell trucks a reality soon**, with pre commercial series ready by 2025 and full commercialisation by 2030 and beyond: **with 5,000-10,000 vehicles, and with up to 95,000 vehicles by 2030, in all segments**. We estimate that we would need approx. **100 hydrogen refuelling stations by 2025 and 1000 stations by 2030 to fill these trucks.**

We will strive to deliver low carbon, renewable hydrogen at a competitive cost at the nozzle. The fact that renewable electricity prices are going down is a sign in this direction. This is in line with the EU's ambition to work on developing a carbon-neutral society, in which not only the tank-to-wheel approach would be considered as is the case in current EU regulations.

Hydrogen supply chain together

Hydrogen Europe

Hydrogen Europe Research

Strategic Research and Innovation Agenda
Final Draft
July 2020

Clean Hydrogen for Europe Partnership preparation

How can the role of H2 trucks be stepped up on the EU's political agenda?

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Hydrogen Europe's Engagement with logistics end-users

Information sharing, business development, community building, advocacy

2019	2020	2021
Set up of of HE's Trucks WG End-users survey Invitation to end-users to join Dec 2019 Trucks WG meeting Joint letter with ACEA & IRU on Hydrogen infrastructure	Trucks WG 5th March FC truck event 1st October FC truck event with ACEA/IRU Collaboration within the FCH JU truck study	Trucks WG (110 companies, 220 members) Collaboration with the ALICE platform Role of European Clean Hydrogen Alliance IPCEIs

Growing number of bilateral discussions

Valérie Bouillon-Delporte
President of Hydrogen Europe
Michelin

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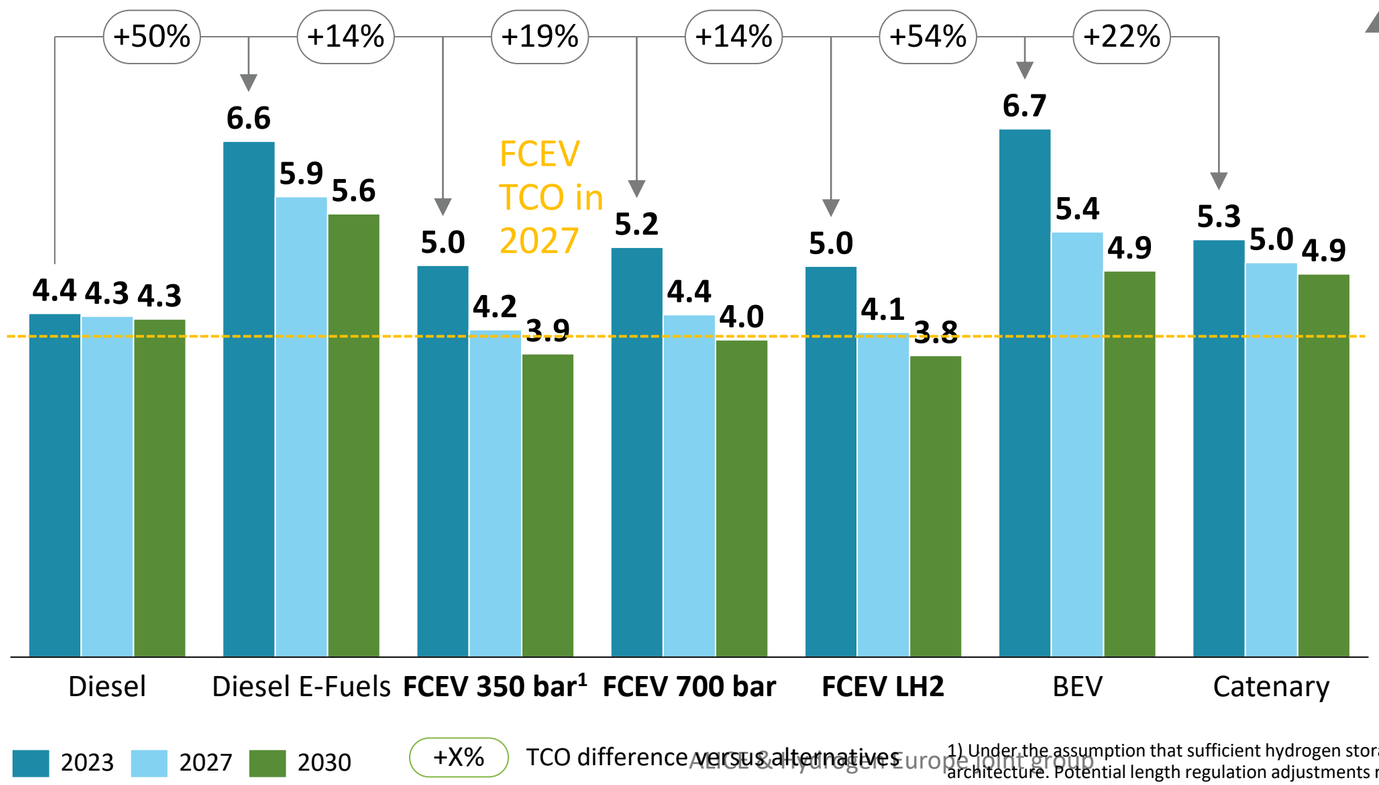
From a TCO perspective, FCH HDT can become cost-competitive with diesel by 2027 if production volumes are ramped up swiftly

High-level TCO assessment – Use case I [EUR ct/tonne-km; 1st & 2nd life]

1 Use case I – Tractor 4x2, 140,000 km annual mileage



- FCH trucks for use case I have a cost premium of up to ~19% in 2023 compared to diesel and could become cheaper if implemented at scale
- FCH truck technologies can be more competitive than the alternatives Diesel E-Fuels, BEV and catenary on a tonne-km basis
- When considering 1st and 2nd life, a significant cost down potential for FCEV at scale exists

Source: Roland Berger

1) Under the assumption that sufficient hydrogen storage can be technically integrated in the current truck chassis architecture. Potential length regulation adjustments required.
2) The technical maturity is at a very early stage and needs to be demonstrated in a truck

Coalition Statement on the deployment of hydrogen trucks: Up to 100,000 trucks from 2030 onwards

Coalition statement signed by the whole value chain on 23 November 2020; signatories foresee that up to 100,000 hydrogen-powered trucks and 1,500 stations will be deployed by 2030

Vehicle OEMs

DAIMLER
HONDA
HYUNDAI
HYZON
IVECO
TOYOTA
VDL

Technology providers

Applus IDIADA
AVL
BALLARD
BOSCH
Cummins
elringklinger
faurecia inspiring mobility
FUEL CELL POWERTRAIN
FPT POWERTRAIN TECHNOLOGIES
FREUDENBERG INNOVATING TOGETHER
GreenGT
Intelligent Energy
LUXFER GAS CYLINDERS
MICHELIN
PLASTIC OMNIUM
PM Fuel Cells · Power Systems
SYMBIO
TOYOTA
WORTHINGTON INDUSTRIES

Infrastructure & H_2 providers

Air Liquide
AIR PRODUCTS
CHART Cooler By Design.™
ENGIE
Everfuel
EWE
H2energy
hynamics EDF GROUP
ITM POWER
Linde
McPhy
nel
snam
Statkraft
TOTAL
VIRŠI

Truck operators / Logistics users

ASKO – vi forsyner Norge med mat
Bioway
BMW GROUP
DB SCHENKER
DISFRIMUR
FERCAM Logistics & Transport
FM LOGISTIC
Sesé
HEINEKEN
Dobele
MPREIS
SCHNELLECKE LOGISTICS
MALHERBE L'avenir est en route
Unilever

Associations & Others

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BeMobility
H2Platform OP WEG MET WATERSTOF
Ha FUNDACIÓN PARA EL DESARROLLO DE LAS NUEVAS TECNOLOGÍAS DEL HIDRÓGENO EN ARAGÓN
H2LV
Port of Rotterdam
VDI
WaterstofNet

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ALICE & Hydrogen Europe joint group

Hydrogen Europe

This Coalition Statement emerges from a study commissioned by the FCH JU

Very positive reaction from Commissioner Vălean

*"I **would like to applaud your coalition's commitment** […] **we need this kind of impulse in parallel** to the AFID revision which will be likewise ambitious. The study you presented today is valuable **because it makes a compelling case for FCH trucks as an upcoming zero emission alternative**"*

*"H2 and FC are sure to have a leading role and the fact that **the EU is a technological leader** in this area will help."*

*"**The next step is to make H2 a real option** for coaches and lorries, **long distance road haul is challenging to decarbonise and H2 provides a promising way for that**. But **we need to move quickly from pilot tests to demonstration** to make the technology available from a commercial point of view "*

Adina Valean, Commissioner for transport, 23 November 2020

The industry is getting ready

15 December 2020

H2Accelerate – new collaboration for zero emission hydrogen trucking at mass-market scale

Air Liquide will build the first high-pressure hydrogen refueling station for long-haul truck: Europe

OMV and Post sign MoU for green hydrogen in heavy goods transport

- OMV & Post: Partnership to promote production, infrastructure and integr tion in existing fleet and reduce CO2
- Intention is for first use in Austria to be achieved by 2023 at the latest
- Goal: 2,000 HGVs powered by green-hydrogen fuel cells by 2030

ENERGY TRANSITION PRESS RELEASE 07 July 2020

Air Liquide and Port of Rotterdam Authority: hydrogen road transport

Air Liquide and the Port of Rotterdam Authority announce the launch of a jointly created initiative, which aims at enabling 1,000 hydrogen-powered zero-emission trucks on the roads connecting the Netherlands, Belgium, and West Germany by 2025. Several partners representing the whole

Switzerland's Lucerne Region Opens Its First Hydrogen Refuelling Station In Rothenburg

All new trucks sold must be fossil free by 2040, agree truck makers and climate researchers

15/12/2020 Twitter LinkedIn Facebook

Brussels/Potsdam, 15 December 2020 – In an unprecedented science-backed statement, Europe's truck manufacturers have concluded that by 2040 all new trucks sold need to be fossil free in order to reach carbon-neutrality by 2050. It will be possible to meet this target provided the right charging/refuelling infrastructure is built and a coherent policy framework is put into place, including comprehensive CO2 pricing to drive the transition.

MAN Truck & Bus To Focus On Hydrogen-Powered Trucks

October 22, 2020

ElringKlinger And VDL Conclude Fuel Cell Partnership

Hydrogen Europe

November 13, 2020

François-Régis le Tourneau
Chairman, ALICE Platform

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ALICE membership is bringing an holistic approach → All key logistics stakeholders represented!

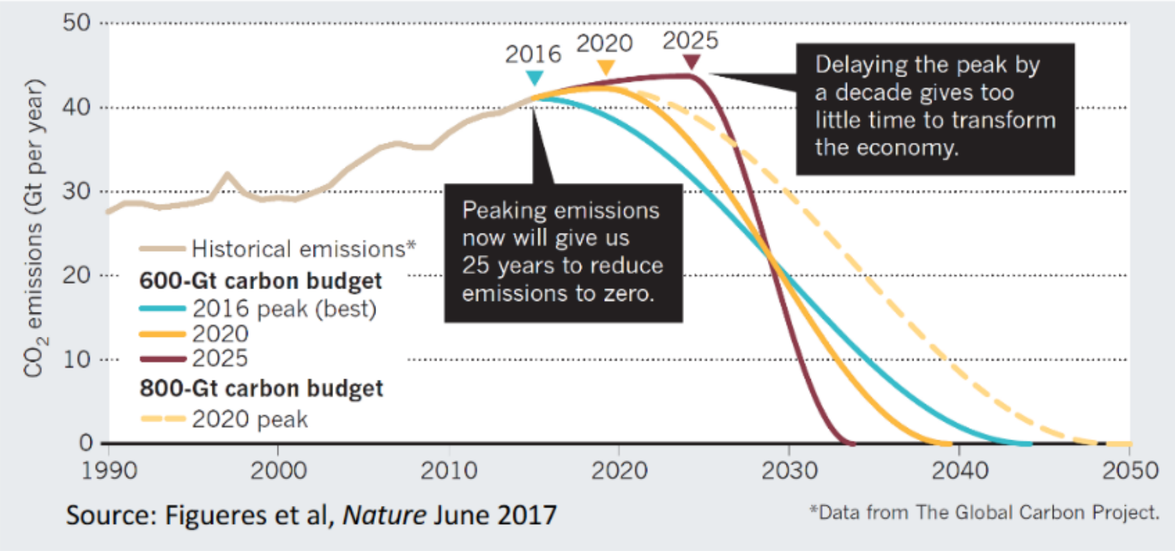
Type of Organization	Members	EU/International Associations
Shippers & Retail		
Logistics Service Providers, Courier and Postal operators & Freight Forwarders		
Ports, Hubs, Intermodal terminals & Transport Infrastructure		
Transport and industry vehicles, packaging & material handling		
Information and Communication Technologies & Consultancy		
Regional & National Logistics Clusters & Associations		
Research and technology Centers		
European Technology Platforms /PPPs		
Member States and innovation Funding*		

** Involved in ALICE Mirror Group*

The challenge in perspective: sense of urgency

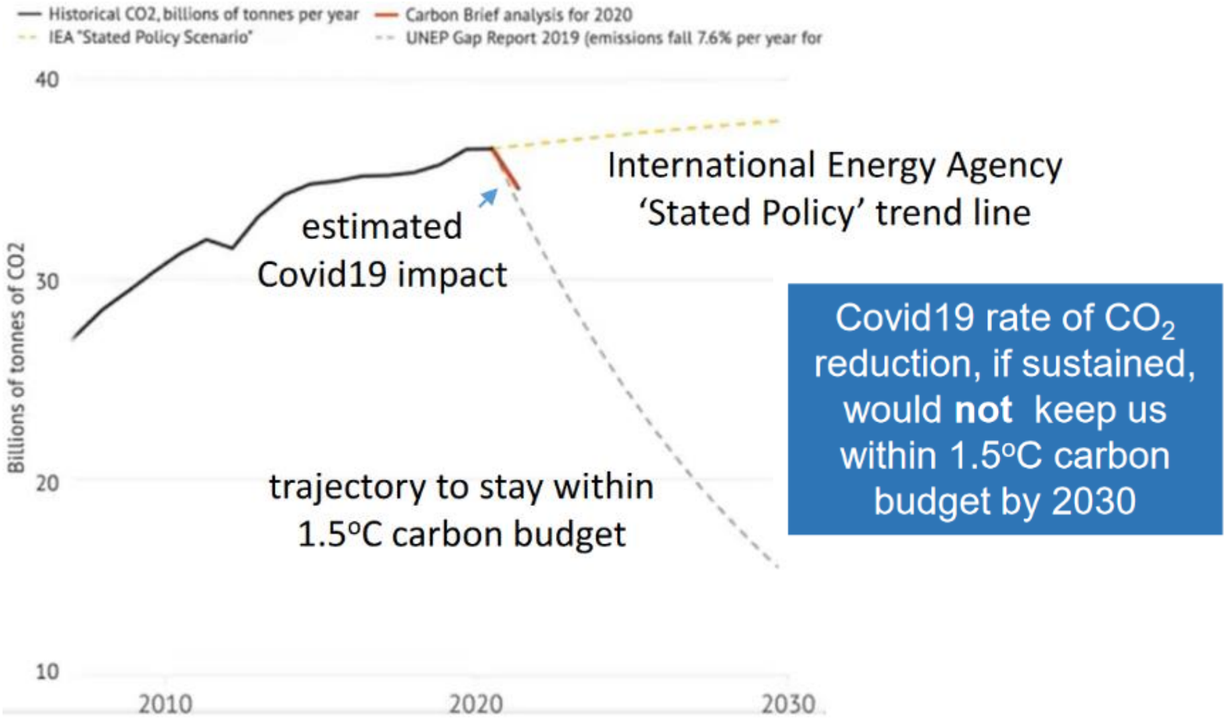
Carbon Budgeting

Need to stay within tight carbon budgets to limit temperature rise to 1.5-2.0°C



https://bit.ly/2WGTINT

Extract from Zero Carbon Logistics (McKinnon CILT conference June 2020)

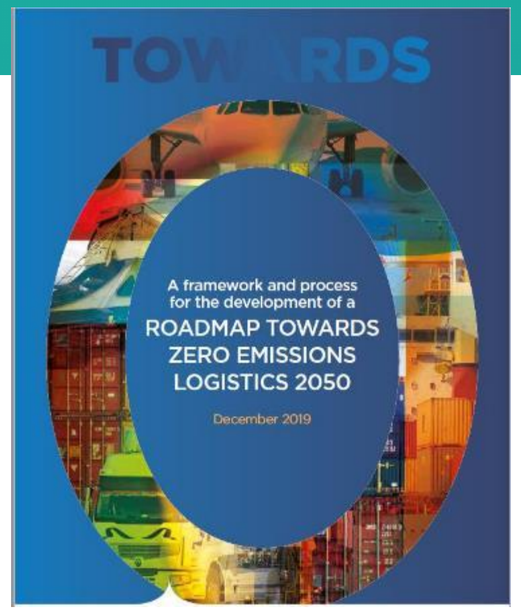


Covid19 rate of CO_2 reduction, if sustained, would **not** keep us within 1.5°C carbon budget by 2030

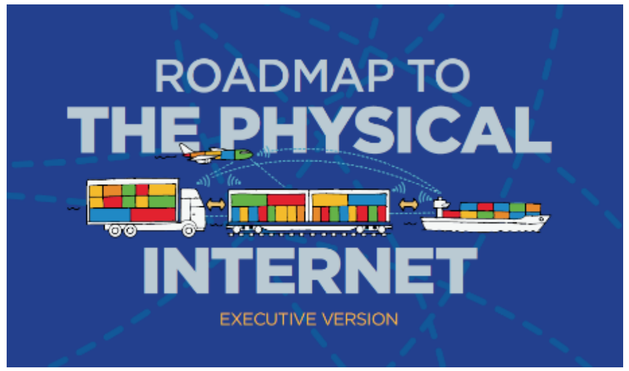
Need to embed concept of carbon budgeting into logistics decarbonisation strategies

Source: Carbon Brief https://bit.ly/2ycB1ok

Towards zero emissions logistics 2050 Roadmap



Link to the document



Link to the document

Technology and Infrastructure readiness will take time

PI PHYSICAL INTERNET

Making assets transition affordable!

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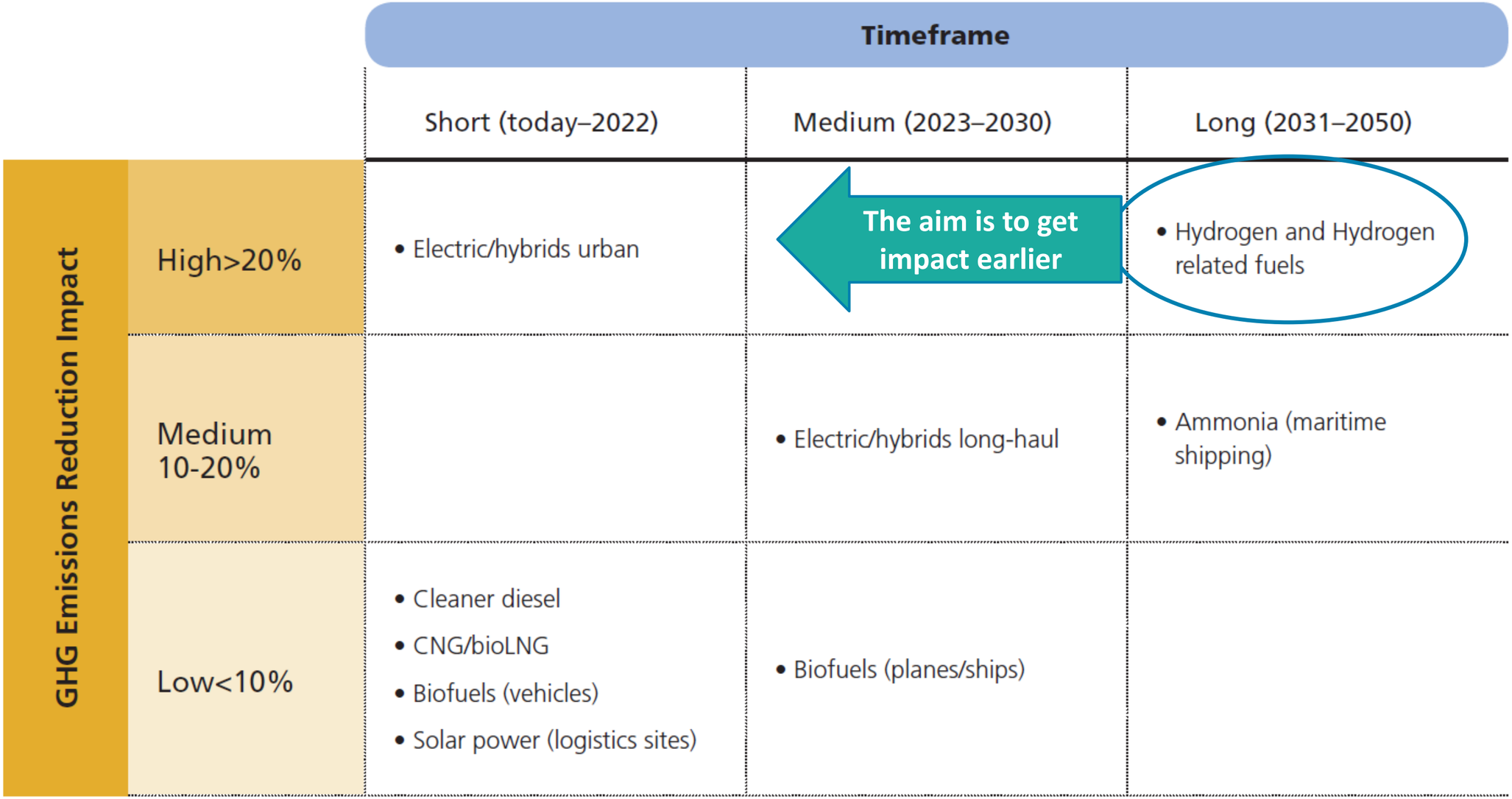
Focus on short-medium term: What we need to do now



Fuel cells and hydrogen

Active members on Hydrogen	
Type of Organization	**Members**
Shippers & Retail	P&G, L'ORÉAL, COLRUYTGROUP, Unilever
Logistics Service Providers, Courier and Postal operators & Freight Forwarders	FM LOGISTIC, Sesé, GRUBER LOGISTICS, CODOGNOTTO, an post
Ports, Hubs, Intermodal terminals & Transport Infrastructure	Port of Rotterdam, Puerto de Algeciras, valenciaport Autoridad Portuaria de Valencia, GENERALI Real Estate
Vehicle Manufacturers	VOLVO, SCANIA

Relevant activities:

- Part of the **Advisory Board** of the FCH HDT study
- **Support members to be part of the Advisory Board** (8 members)
- **Case studies** from ALICE members included
- Link with relevant initiatives: **HE / EC /partnerships**
  - **2ZERO HE partnership**

If you want to go fast, go alone **If you want to go far, go together**

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ALICE & Hydrogen Europe joint group