Nationaal Binnenvaart Congres

Ontmoet. Ontdek. Ontwikkel.

WATERSTOF IN DE BINNENVAART

NPRC

Kees de Vries

NPRC
EST. 1935

Nouryon

TOGETHER, WE CAN DO SO MUCH MORE

Het Weva-project Waterstof-elektrisch vrachtschip Antonie

Waterstof Coalitie Binnenvaart

Kees de Vries; adviseur vergroening binnenvaart (Nederlandse Particuliere Rijnvaart Centrale NPRC)

projectleider Weva-project (NPRC-Nouryon-Lenten)

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Waterstof Coalitie Binnenvaart

Opzet presentatie

-energietransitie en binnenvaart

-het Weva-project

-uitdagingen en oplossingen

-deelnemen aan zero-emissie-initiatieven

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Nieuwbouw ms Antonie 135 m. (3700 ton) 100% op waterstof

Waterstof Coalitie Binnenvaart

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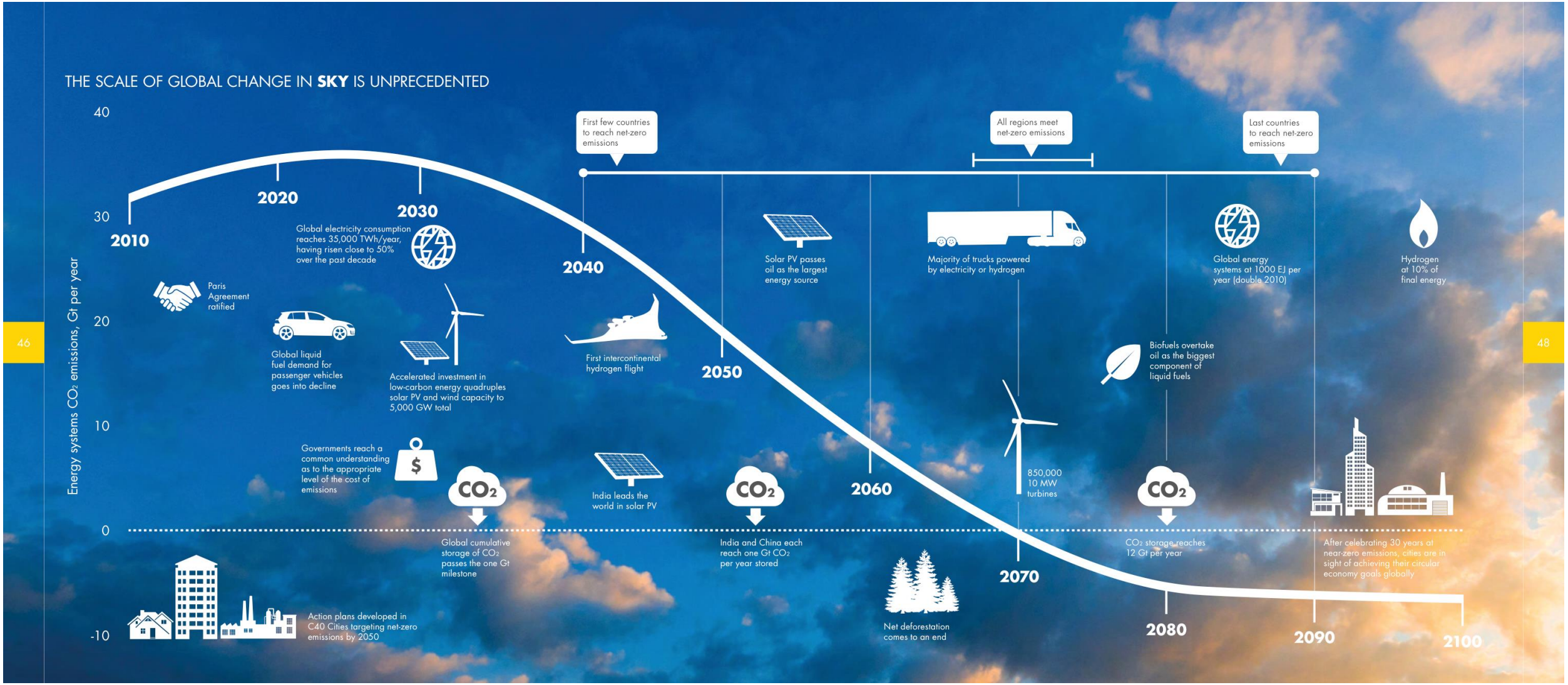
Binnenvaartondernemer Harm Lenten

Stoppen met fossiel?



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Shell: toekomstscenario energietransitie

Stoppen met fossiel?

A NEW ENERGY SYSTEM

Over the past 200 years, our contact with energy has changed radically. For most of the global population in the early years of the 19th century, energy needs were met individually by collecting and burning wood, although coal deliveries in towns and cities were just commencing. Candles for domestic lighting were either made at home or purchased from a local chandler, who used various animal fats. One hundred years later, but primarily in wealthier countries, lighting was supplied by town gas, kerosene lamps, and for a rapidly increasing number of people, electricity. While there remain a disturbing number of people with little to no energy access today, much of the global population make regular use of petroleum products, natural gas, and electricity. But what could that look like in the latter part of this century as we reach for net-zero emissions? In **Sky**, an electricity-based energy system supplants the largely fossil fuel-based system of today.

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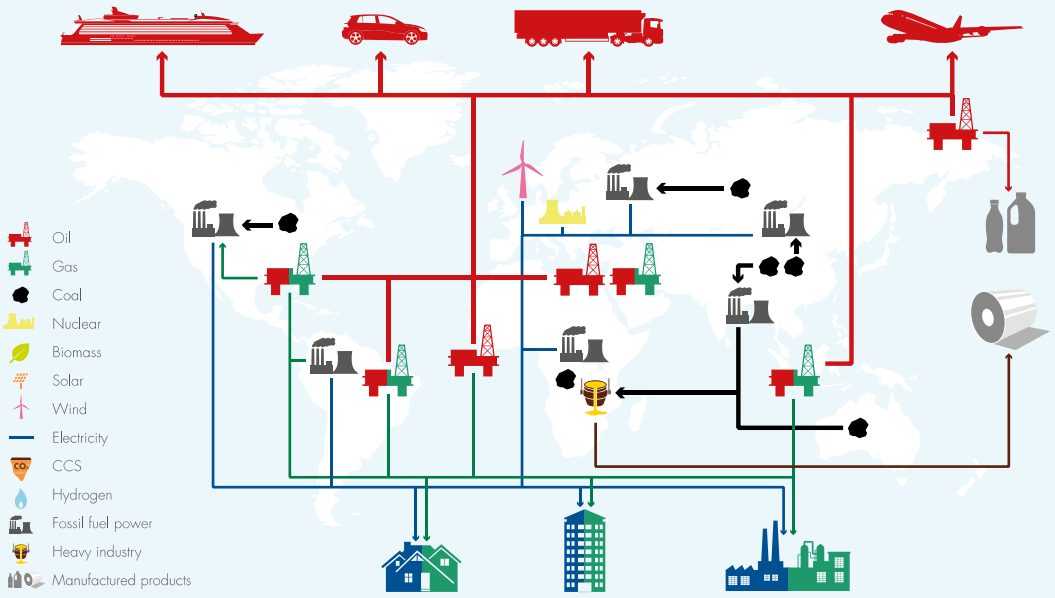
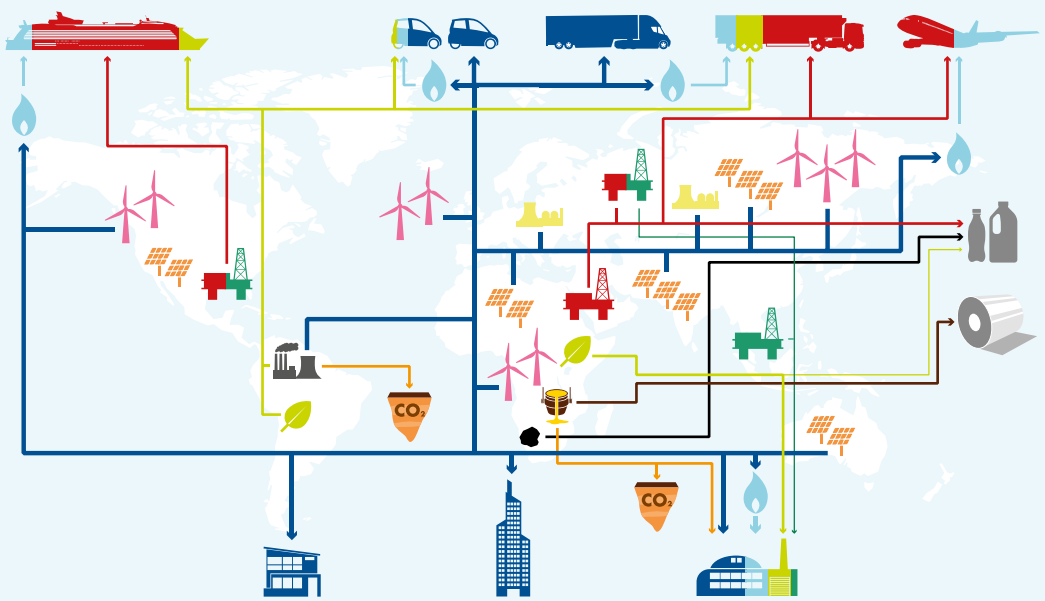
TODAY – AN ENERGY SYSTEM BASED ON FOSSIL FUELS



SKY IN 2070 – AN ELECTRICITY-BASED ENERGY SYSTEM



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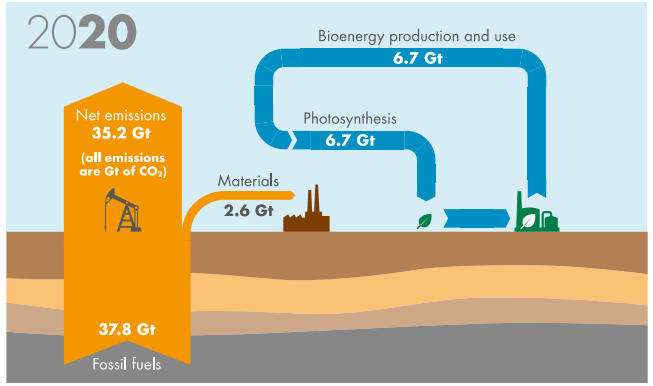
Shell: toekomstscenario energietransitie

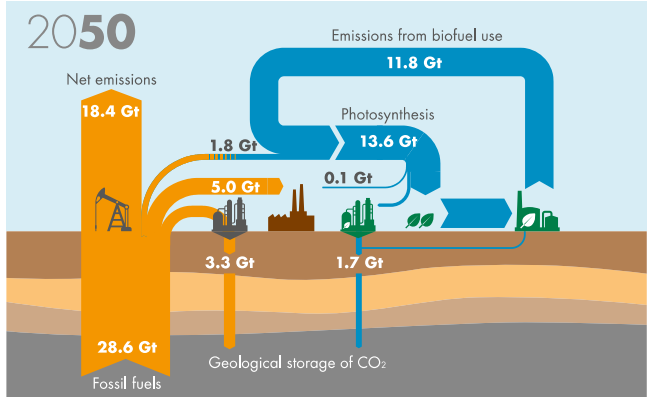
Stoppen met fossiel?

THE EVOLVING ENERGY SYSTEM CO_2 BALANCE SHEET IN **SKY**

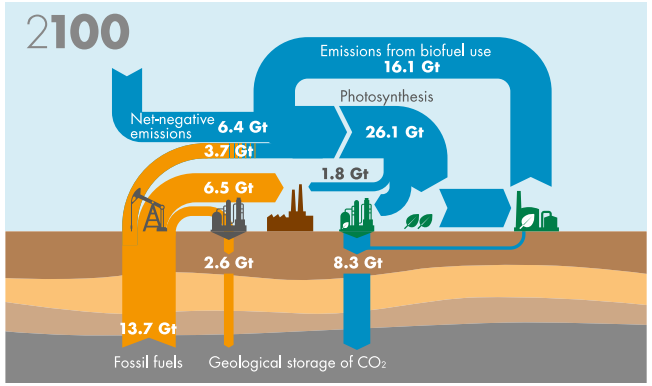
Fossil fuel production | CCS | Biofuel production | Bioenergy with CCS | Carbon in products | Growing biomass



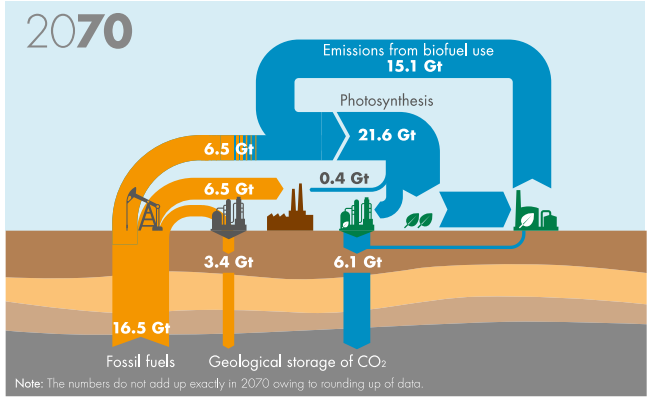
Today, most carbon in fossil energy production is burned and emitted to the atmosphere, while the CO_2 absorbed by wood and other plants used for energy is also returned to the atmosphere.



In **Sky**, in 2050, the storage of CO_2 is rapidly scaling up. There are equal contributions from the embedded carbon in materials production and CCS. Fossil energy CCS leads the way, but bioenergy CCS (BECCS) is close behind.



In **Sky**, at 2100, the bioenergy system has reached its resource base limit and is twice the size of the fossil energy system in CO_2 terms. The active management of CO_2 means that the total energy system is providing a drawdown of CO_2 from the atmosphere.



In **Sky**, in 2070, the energy system has achieved net-zero emissions. Fossil energy production is less than half today's level. Alongside direct CCS and the use of carbon for materials, the remaining fossil energy emissions are fully offset by captured CO_2 from an expanded bioenergy system.

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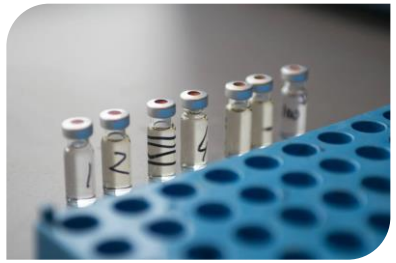
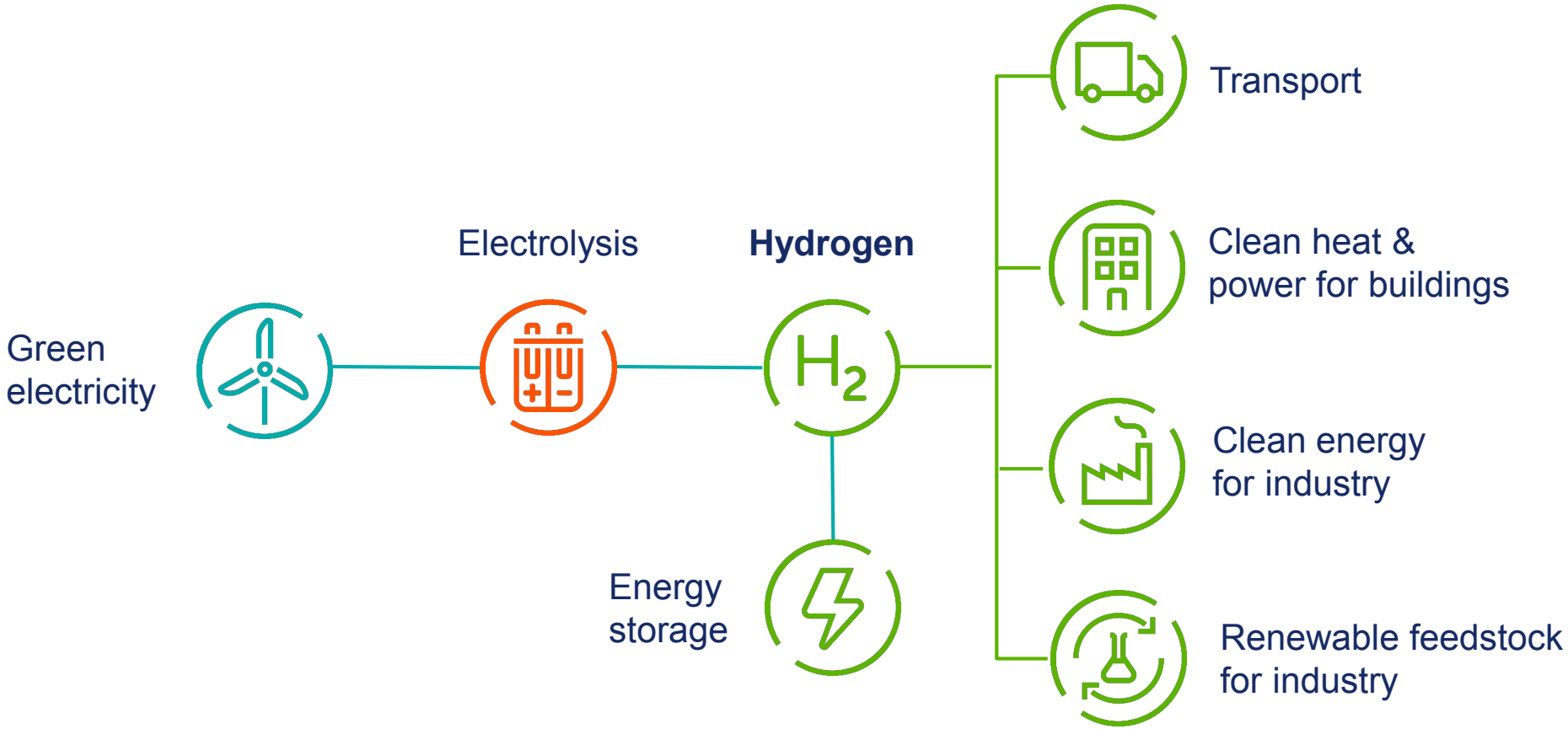
Shell: toekomstscenario energietransitie

Nouryon

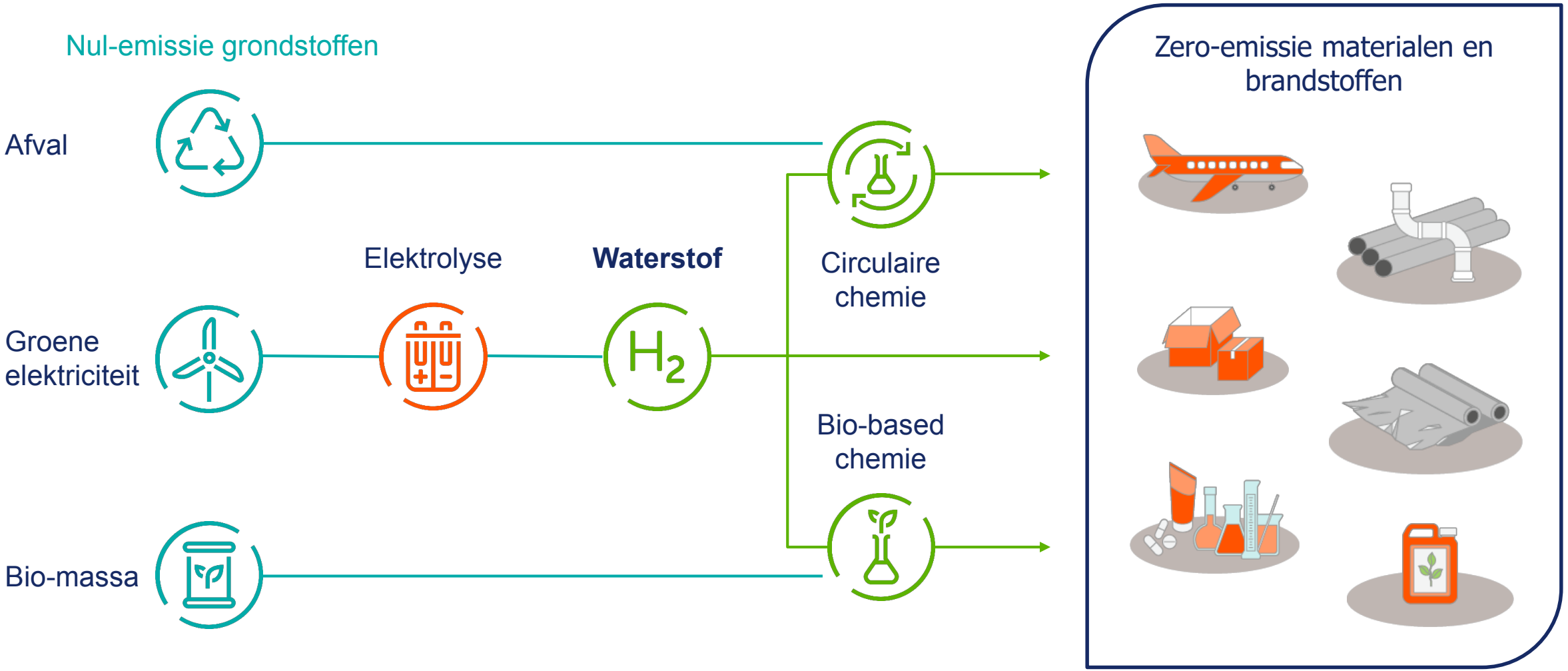


We need to prepare for the industry and fuels transition

Nouryon


Green electricity
Electrolysis
Hydrogen
H_2
Energy storage
Transport
Clean heat & power for buildings
Clean energy for industry
Renewable feedstock for industry

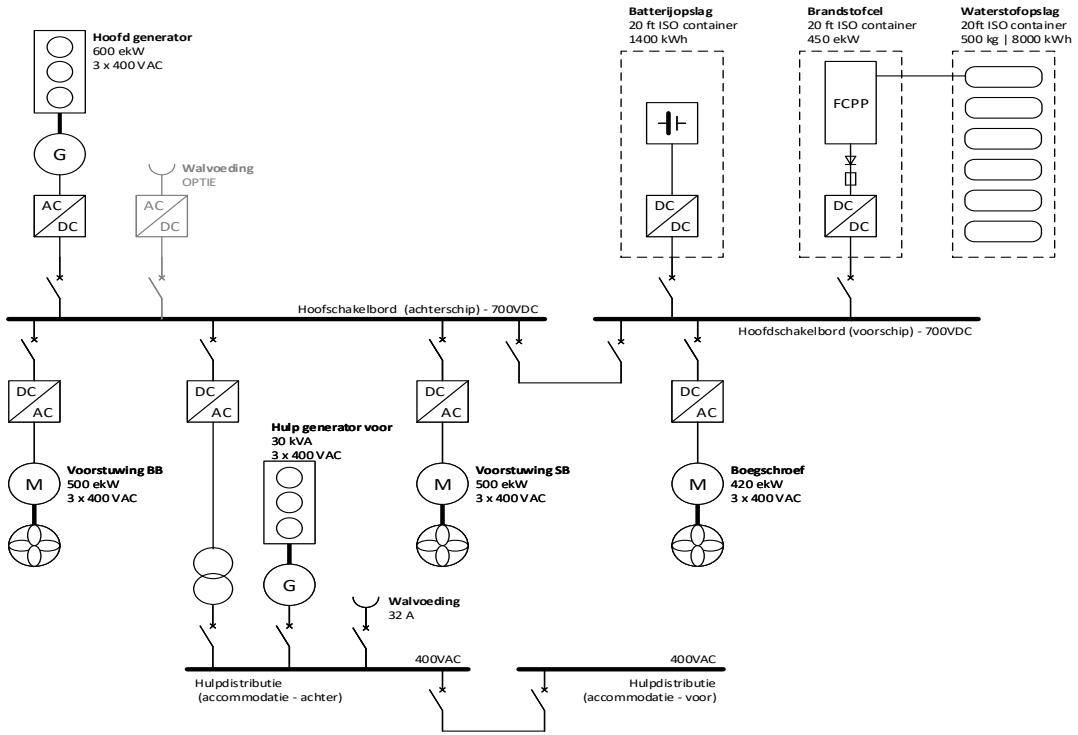
Nouryon


Nul-emissie grondstoffen
Afval
Groene elektriciteit
Bio-massa
Elektrolyse
Waterstof
H_2
Circulaire chemie
Bio-based chemie
Zero-emissie materialen en brandstoffen

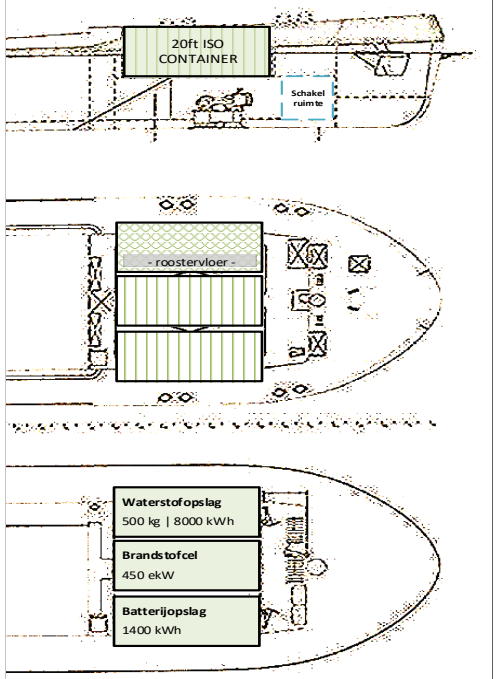
NPRC
Since 1935

40 kW brandstofcel (Nedstack)

MOGELIJKE BRANDSTOFCEL PAY-PER-USE CONFIGURATIE



SITUATIE SCHETS MET WISSELBARE OPSLAGCONTAINERS



	01-02-19	KV	GG	RP	CHK
	24-01-19	JB	JB	JB	DRN
Modulair energie concept	Opmerkingen klant	Concept			DESCRIPTION

NPRC
Boterdiep 46
3077 AW ROTTERDAM
The Netherlands
www.nprc.eu

NEDSTACK
Westervoortsedijk 73
6827 AV ARNHEM
The Netherlands
www.nedstack.com

Project
Modulaire Energie Container
Brandstofcel aangedreven binnenvaartschip

Scale
-

Drawing title
Systeemtekening

Number

Stroomschema Antonie (H2)

Waterstof Coalitie Binnenvaart

De beste keuzen voor de toekomst

-zoek alternatieven voor fossiel, desnoods gedeeltelijk,

-onderzoek zero-emissie, desnoods gedeeltelijk

-de schroefas is altijd elektrisch aangedreven,

-vergroeningsprojecten samen met verlader opzetten,

-batterijen voor korte afstanden, vaste trajecten,

-waterstof voor grote nieuwe projecten met subsidie

-bestaande schepen; vergroenen binnen haalbare kaders (kijk ook naar bio-brandstoffen en methanol)

NPRC EST. 1935

Waterstof Coalitie Binnenvaart

Deelnemen aan Zero-emissie-initiatieven?

-zoveel mogelijk in coöperatie met een verlader en andere ketenpartijen,

-zoveel mogelijk kiezen voor dezelfde opschaalbare technieken en open access (vrije toegang),

NPRC EST. 1935

NPRC
EST. 1935

Nouryon

TOGETHER, WE CAN DO SO MUCH MORE