绿氢在能源企业转型中的作用
Green hydrogen's role in corporate energy transition

2021年11月7日

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WARNING: uncertainties ahead

This presentation contains data and analysis from Shell's Sky scenario. Unlike Shell's previously published Mountains and Oceans exploratory scenarios, the Sky scenario is based on the assumption that society reaches the Paris Agreement's goal of holding the rise in global average temperatures this century to well below two degrees Celsius (2°C) above pre-industrial levels. Unlike Shell's Mountains and Oceans scenarios, which unfolded in an open-ended way based upon plausible assumptions and quantifications, the Sky scenario was specifically designed to reach the Paris Agreement's goal in a technically possible manner. These scenarios are a part of an ongoing process used in Shell for over 40 years to challenge executives' perspectives on the future business environment. They are designed to stretch management to consider even events that may only be remotely possible. Scenarios, therefore, are not intended to be predictions of likely future events or outcomes.

Additionally, it is important to note that as of 8/6/2021, Shell's operating plans and budgets do not reflect Shell's net-zero emissions ambition. Shell's aim is that, in the future, its operating plans and budgets will change to reflect this movement towards its new net-zero emissions ambition. However, these plans and budgets need to be in step with the movement towards a net-zero emissions economy within society and among Shell's customers.

Also, in this presentation we may refer to "Shell's Net Carbon Footprint", which includes Shell's carbon emissions from the production of our energy products, our suppliers' carbon emissions in supplying energy for that production and our customers' carbon emissions associated with their use of the energy products we sell. Shell only controls its own emissions but, to support society in achieving the Paris Agreement goals, we aim to help and influence such suppliers and consumers to likewise lower their emissions. The use of the terminology "Shell's Net Carbon Footprint" is for convenience only and not intended to suggest these emissions are those of Shell or its subsidiaries.

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate legal entities. In this presentation "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to Royal Dutch Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities. ''Subsidiaries'', "Shell subsidiaries" and "Shell companies" as used in this presentation refer to entities over which Royal Dutch Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as "joint ventures" and "joint operations", respectively. Entities over which Shell has significant influence but neither control nor joint control are referred to as "associates". The term "Shell interest" is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

This presentation contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "aim", "ambition', ''anticipate'', ''believe'', ''could'', ''estimate'', ''expect'', ''goals'', ''intend'', ''may'', ''objectives'', ''outlook'', ''plan'', ''probably'', ''project'', ''risks'', "schedule", ''seek'', ''should'', ''target'', ''will'' and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this presentation, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this presentation are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Royal Dutch Shell's Form 20-F for the year ended December 31, 2019 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward-looking statements contained in this presentation and should be considered by the reader. Each forward-looking statement speaks only as of the date of this presentation, 07/11/2021. Neither Royal Dutch Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this presentation.

We may have used certain terms, such as resources, in this presentation that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. Investors are urged to consider closely the disclosure in our Form 20-F, File No 1-32575, available on the SEC website www.sec.gov.

2050年前实现净零排放
Net-zero emissions from own operations by 2050 or sooner

与社会和客户同步改变 • Changing in step with society and our customers

在2050年前实现能源业务净零排放

A net-zero emissions energy business by 2050 or sooner

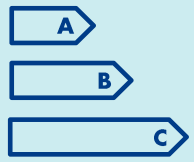
净碳足迹1.5 °C愿景
Net Carbon Footprint ambition 1.5°C

业务运营净零排放
Net-zero emissions from own operations

携手伙伴实现能源脱碳
Partnering for decarbonisation of energy use

2050年前实现净零排放
Net-zero emissions from own operations by 2050 or sooner

致力于所有壳牌产品的生产实现净零排放
Aiming to be net-zero on all the emissions from the manufacture of all our products[1]



能源效率
Energy Efficiency

- 运营改进
  Operational improvements
- 流程优化
  Process optimisation
- 减少点火放空、冷放空、逸散
  Reducing flaring / venting / fugitives

低碳能源应用
Use of low-carbon energy

- 低碳和零碳的电力和蒸汽
  Low- and zero-carbon electricity and steam
- 生物质 · Biofuels
- 氢能 · Hydrogen

碳汇
Carbon sinks

- 碳捕捉、利用和储存
  Carbon capture, utilisation & storage
- 基于自然的解决方案
  Nature-based solutions

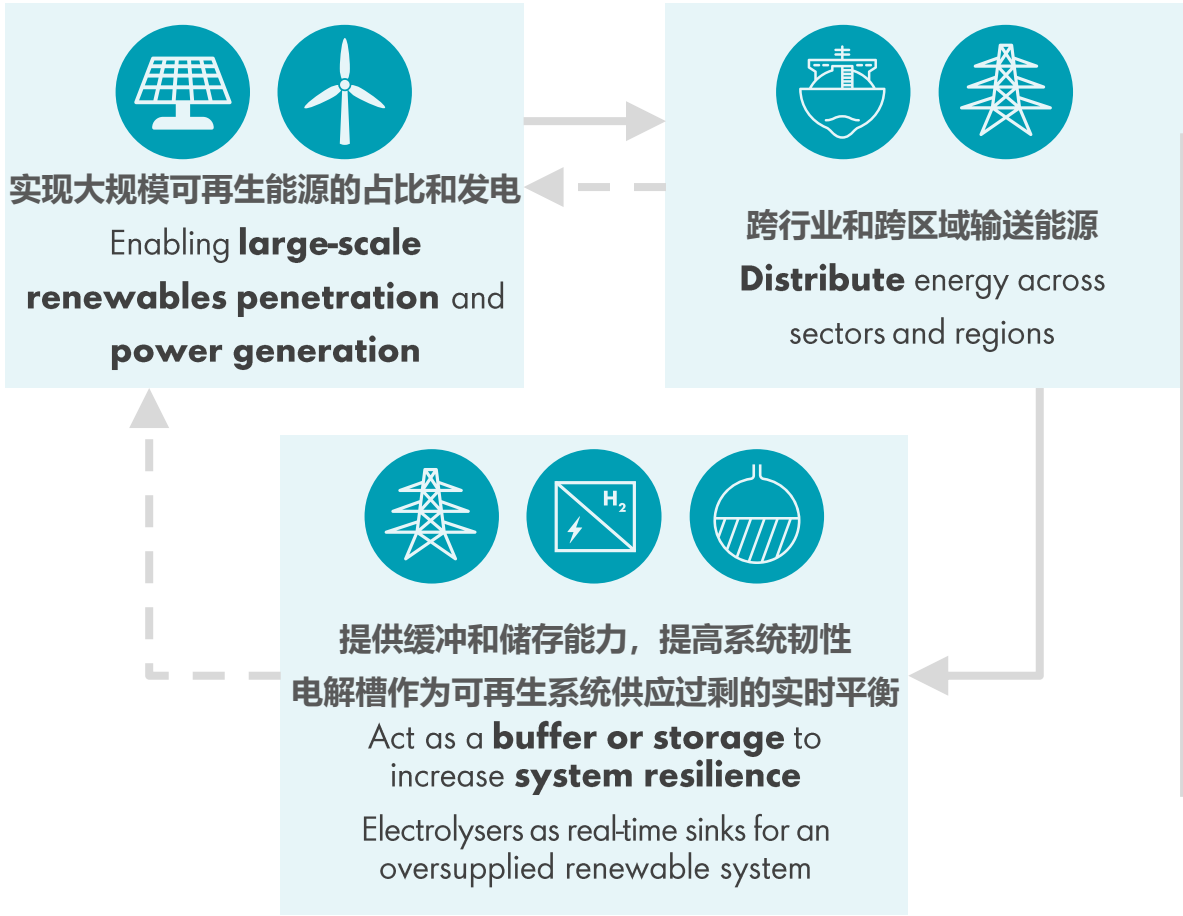
监管
Governance

- 与温室气体排放相关的温室气体价
  Potential GHG costs associated with operational GHG emissions
- 温室气体能源管理计划
  Greenhouse gas energy management plans
- 项目绩效标准或行业基准
  Performance standards or industry benchmarks for projects

[1] Refers to the Scopes 1 and 2 emissions in absolute terms associated with operations under direct Shell control

氢能助力净零排放的未来
Hydrogen is needed to achieve a net-zero future

实现可再生能源的高占比、广分布和提高其系统韧性
Enable deep renewables penetration, distribution and system resilience



从重到轻再到终端用户的脱碳行动
Decarbonise hard-to-abate end-uses

壳牌实现净零排放的路径
How Shell will get to net-zero
通过一体化的能源和脱碳方案满足客户需求
Meeting customer demand with integrated energy and decarbonisation solutions

从客户出发
Start with the customer

使命：壳牌的使命是帮助客户所在的行业、业务、社区和家庭脱碳。我们从客户出发思考：客户想要什么和需要什么?

Mission: Shell's mission is to help customers decarbonise their own sectors, businesses, communities and homes. We start with the customer and say: what do they want and need?

倾听和学习：在过去数年中，客户不断告诉我们，他们想要便捷性、灵活性、有竞争力的价格、供应安全和与日俱增的简化脱碳复杂性的需求

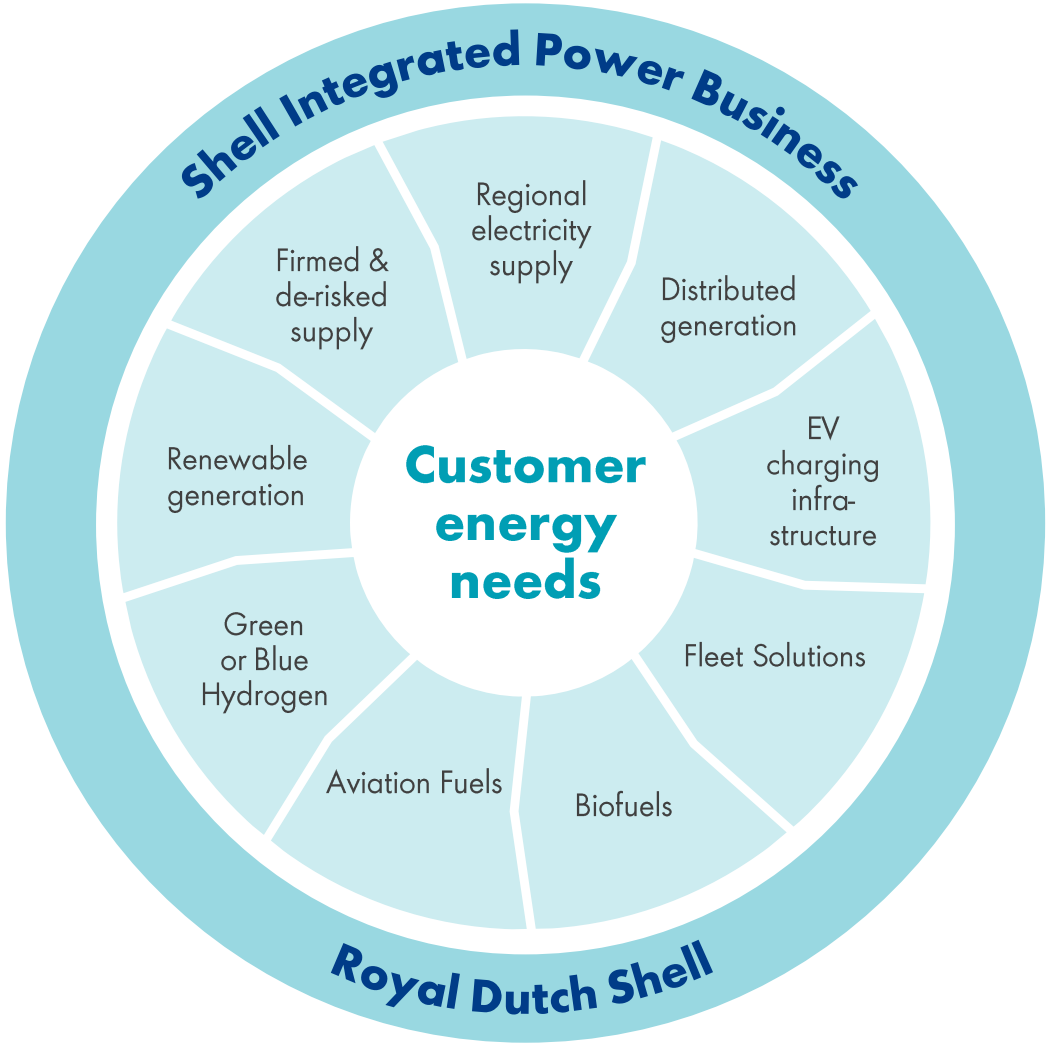
Listening and learning: Over the last few years, customers repeatedly told us they want convenience, mobility, competitive prices, security of supply and – increasingly – to simplify the complexity of decarbonisation.

灵活方式：基于跨行业和跨市场的客户需求的不同，最终，我们采取了灵活的方式，而非单一固定的解决方案。

Flexible approach: As a consequence, we are adopting a flexible approach, given that our customers' needs vary across sectors and markets and that there is no one size fit all solution.

多种方案：在壳牌内部可以找到满足客户需求拼图的大多数模块。从一体化的电力到电动汽车，能源获取，城市解决方案，基于自然的解决方案，以及氢能。

Multiple solutions: And many of the puzzle pieces needed to help customers can be found in Shell. From integrated power to e-mobility to energy access, to city solutions to nature-based solutions and hydrogen.



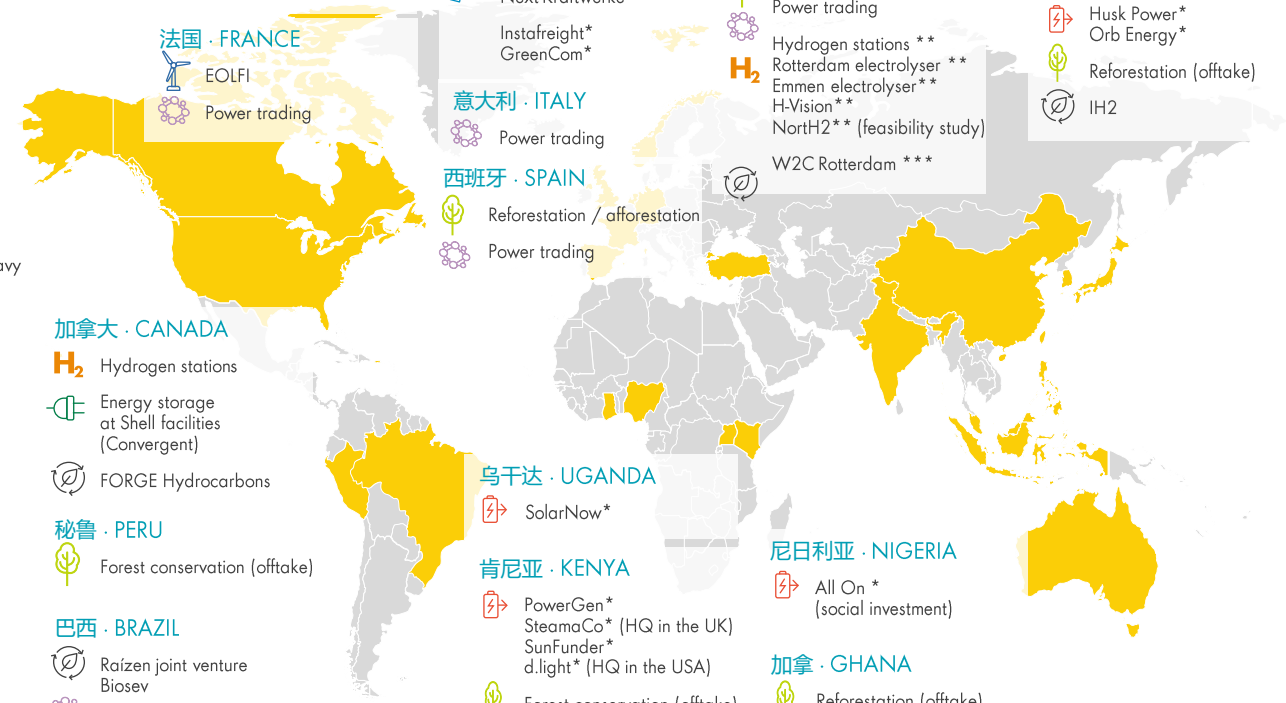
客户为先的一体化能源方案
A customer-led integrated energy offering

壳牌向客户提供一体化的解决方案 — 从生物质燃料到氢能、太阳能和风能 —— 同时运用自然和科技来捕捉难以脱碳的行业的排放。此处列出了我们在这方面的行动。

Shell offers integrated solutions to customers – from biofuels, to hydrogen, solar and wind – while using nature and technology to capture emissions from hard-to-abate sectors. Here is a selection of our activities.

图例 · KEY

- 风能 · Wind
- 太阳能 · Solar
- 车 · Mobility
- 能源解决方案 · Energy solutions
- 能源获取 · Energy access
- 壳牌风投 · Shell Ventures
- 基于自然的解决方案 · Nature-based solutions
- 电力交易 · Power trading & marketing
- H_2 氢能 · Hydrogen
- 生物质燃料 · Biofuels
- * 少数股权投资 · Minority investments
- ** 未建成 · Not built yet
- *** 未建成的少数股权投资项目 Minority investment, not yet built



挪威 · NORWAY
- TetraSpar*
- Corvus Energy*

爱尔兰 · IRELAND
- Emerald floating wind project ***

英国 · UNITED KINGDOM
- Shell Energy Retail
  Hudson Energy
  Limejump
- H_2 Hydrogen stations
- Drover*
- WonderBill*; Masabi*; Ravin.ai*
- Reforestration/afforestation
- Power trading

德国 · GERMANY
- H_2 H_2 Mobility
  RefHyne electrolyser**10MW
  Hamburg-Moorburg power plant electrolyser **
  100MW (feasibility study)
- Rheinland – low carbon diesel production
- Sonnen
- Power trading
  Next Kraftwerke
- Instafreight*
  GreenCom*

荷兰 · NETHERLANDS
- NoordzeeWind **108MW**
  Blauwwind **731.5MW**
  Hollandse Kust (noord)
  ****759MW**
- Moerdijk solar farm **29MW**
- NewMotion
- Nordsol***
  Asperitas*
- Afforestation
- Power trading
- H_2 Hydrogen stations **
  Rotterdam electrolyser **
  Emmen electrolyser**
  H-Vision**
  NortH2** (feasibility study)
- W2C Rotterdam ***

土耳其 · TURKEY
- Power trading

中国 · CHINA
- Power trading
- Afforestation
  Reforestation
- H_2 20MW electrolyser

印度 · INDIA
- Husk Power*
  Orb Energy*
- Reforestation (offtake)
- IH2

日本 · JAPAN
- Power trading
- H_2 HySTRA

韩国 · SOUTH KOREA
- CoensHexicon**

新加坡 · SINGAPORE
- Cleantech Solar*
- Sunseap*

菲律宾 · PHILIPPINES
- Connected Freight*
- Power trading

马来西亚 · MALAYSIA
- Reforestation

印度尼西亚 · INDONESIA
- Forest conservation (offtake)

澳大利亚 · AUSTRALIA
- Shell Energy
- ESCO Pacific*
  Gangarri solar farm**
  120MW
- Reforestation
  Afforestation
  Select Carbon

法国 · FRANCE
- EOLFI
- Power trading

意大利 · ITALY
- Power trading

西班牙 · SPAIN
- Reforestation / afforestation
- Power trading

美国 · USA
- Atlantic Shores Offshore Wind**
  2.5GW
  Mayflower Wind Energy** **1.6GW**
  Four onshore wind farms **311.5MW**
- Silicon Ranch*
- Greenlots
- H_2 Hydrogen stations for heavy duty & light duty vehicles
- Shell New Energies
  Junction City
- Power trading
  MP2 Energy*
- Energy Inside
  EcoSmart Solutions*
- Ample*
  Aurora*
  AutoGrid*
  Revel*
  Sense Photonics*
  South 8*
  LO3 Energy*
  Palmetto*
  Sense Home Monitor*
  Innowatts*
  Spiffy*

加拿大 · CANADA
- H_2 Hydrogen stations
- Energy storage at Shell facilities (Convergent)
- FORGE Hydrocarbons

秘鲁 · PERU
- Forest conservation (offtake)

巴西 · BRAZIL
- Raízen joint venture
  Biosev
- Power trading

乌干达 · UGANDA
- SolarNow*

肯尼亚 · KENYA
- PowerGen*
  SteamaCo* (HQ in the UK)
  SunFunder*
  d.light* (HQ in the USA)
- Forest conservation (offtake)

尼日利亚 · NIGERIA
- All On *
  (social investment)

加拿 · GHANA
- Reforestation (offtake)

The locations listed indicate the company's headquarters, market or examples of where they operate.

壳牌推动氢能行业的进展
How Shell is advancing in hydrogen industry

壳牌拥有实现氢能业务成功的关键能力
Shell has critical capabilities to succeed in the hydrogen business

工艺安全领军企业
Leader in process safety

数十载氢能经验
Decades of experience in hydrogen

创新和研发的持续投资
Continued investments in innovation, research and development

合作伙伴和客户网络
Extensive network of strong partners and customers

广受认可的项目执行能力
Widely recognized for project execution capabilities

从生产到供应的一体化方案
Integrated offer from production to supply

政府信赖的合作伙伴
Credible partner in a coalition to work with governments

壳牌氢能战略
Our strategy

供应车用氢能
Providing hydrogen for mobility

- 建设加氢站网络，服务长途重卡和公交
  Building a HRS network for long-haul heavy-duty road transport for trucks and buses.
- 服务中轻型车辆的加氢站
  HRS for light duty and medium duty vehicles.
- 优化清洁氢能的供应和分销
  Optimise supply and distribution of clean hydrogen.
- 评估船用氢能
  Evaluate hydrogen opportunities for shipping.
- 与其他行业，包括航空业，探索远期氢能解决方案
  Work with other sectors, including aviation, to identify long term hydrogen solutions.

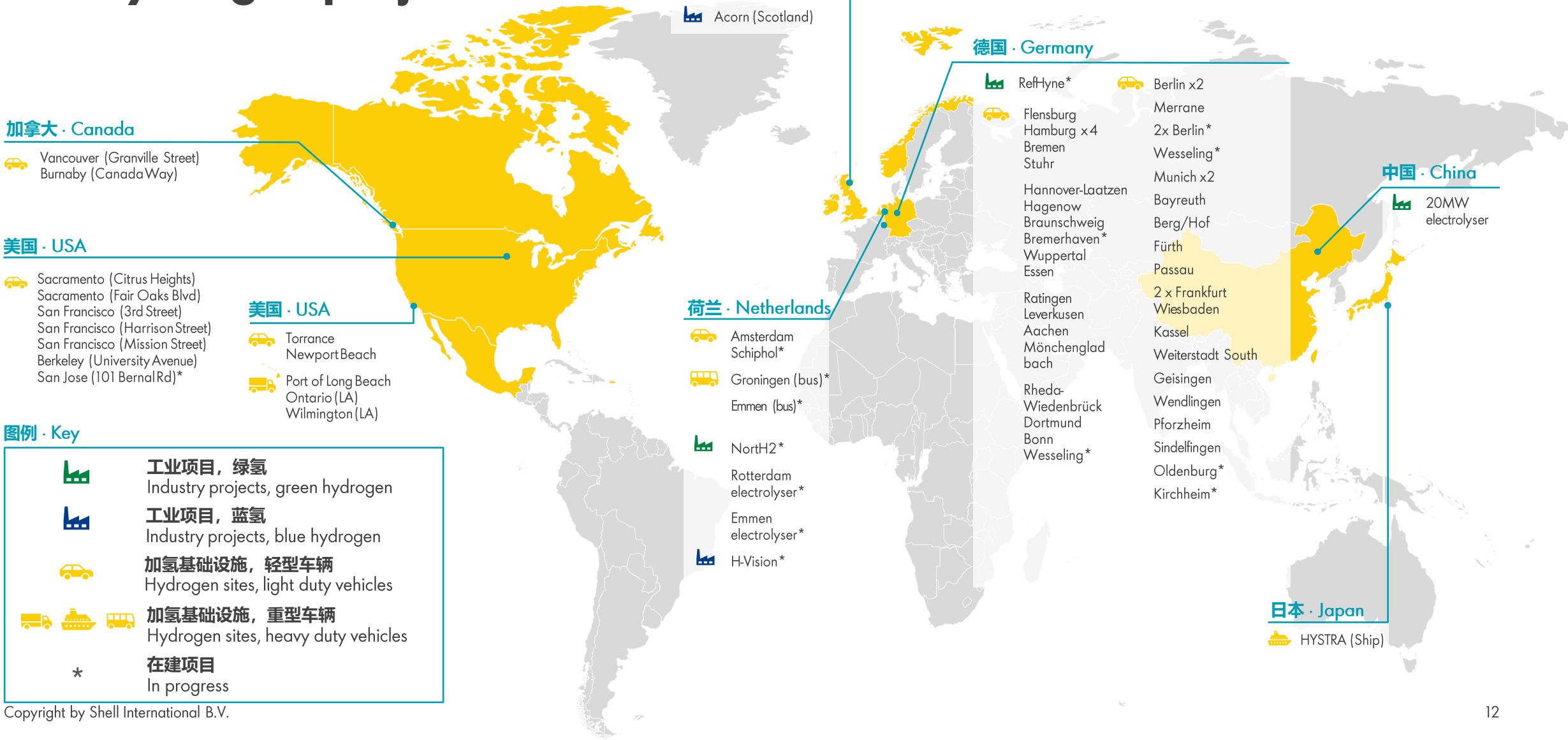
供应工业氢源
Providing hydrogen for industry

- 通过行业合作，部署大规模氢能供应和需求
  Orchestrate large scale hydrogen supply and demand through sector coupling.
- 扩大绿氢规模化应用
  Maximise scale up of green hydrogen.
- 开发蓝氢，助力能源转型，为绿氢应用铺平道路
  Develop blue hydrogen to help accelerate the energy transition and pave way for green hydrogen production.

业务增长要素
How we intend to grow

- 与客户紧密合作
  Work closely with our customers.
- 与行业伙伴合作开发端到端的解决方案
  Collaboration with industry partners to develop end-to-end solutions.
- 与政府和监管部门沟通推动政策支持
  Liaise with government and regulators to further policy support.
- 通过自身氢能需求带动市场成长
  Leverage own hydrogen demand to initiate market growth.
- 降低成本，提升经济可行性
  Lower costs to reach economic viability.
- 验证安全性
  Show Safety.

壳牌氢能项目
Our hydrogen projects



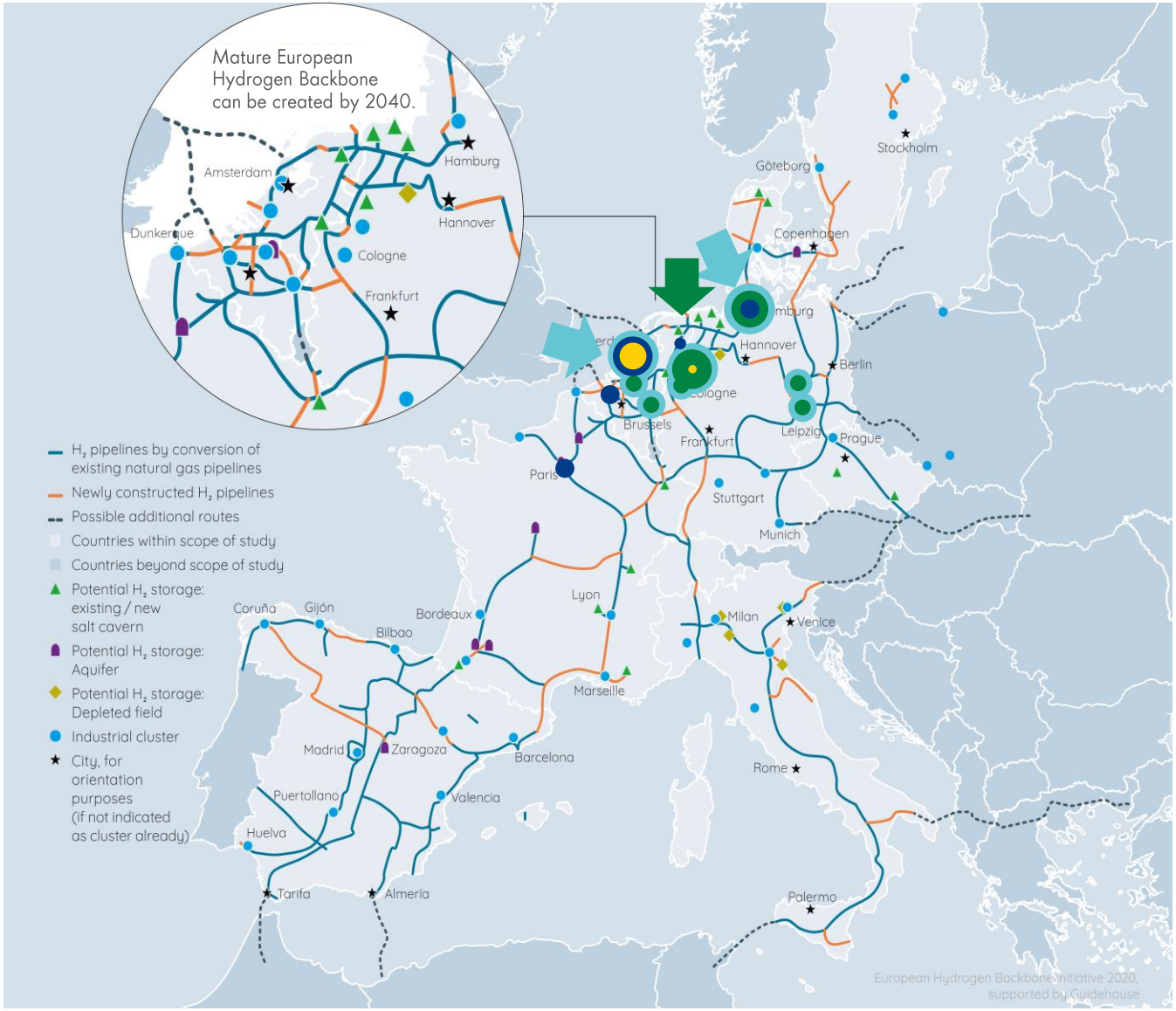
图例 · Key

- **工业项目，绿氢** Industry projects, green hydrogen
- **工业项目，蓝氢** Industry projects, blue hydrogen
- **加氢基础设施，轻型车辆** Hydrogen sites, light duty vehicles
- **加氢基础设施，重型车辆** Hydrogen sites, heavy duty vehicles
- * **在建项目** In progress

随着基础设施的改善，工业领域脱碳从产业枢纽向产业集群延申
Decarbonizing industry starts at hubs, expanding to industry clusters as the infrastructure develops

增加不确定性与风险
Increasing uncertainty & risk

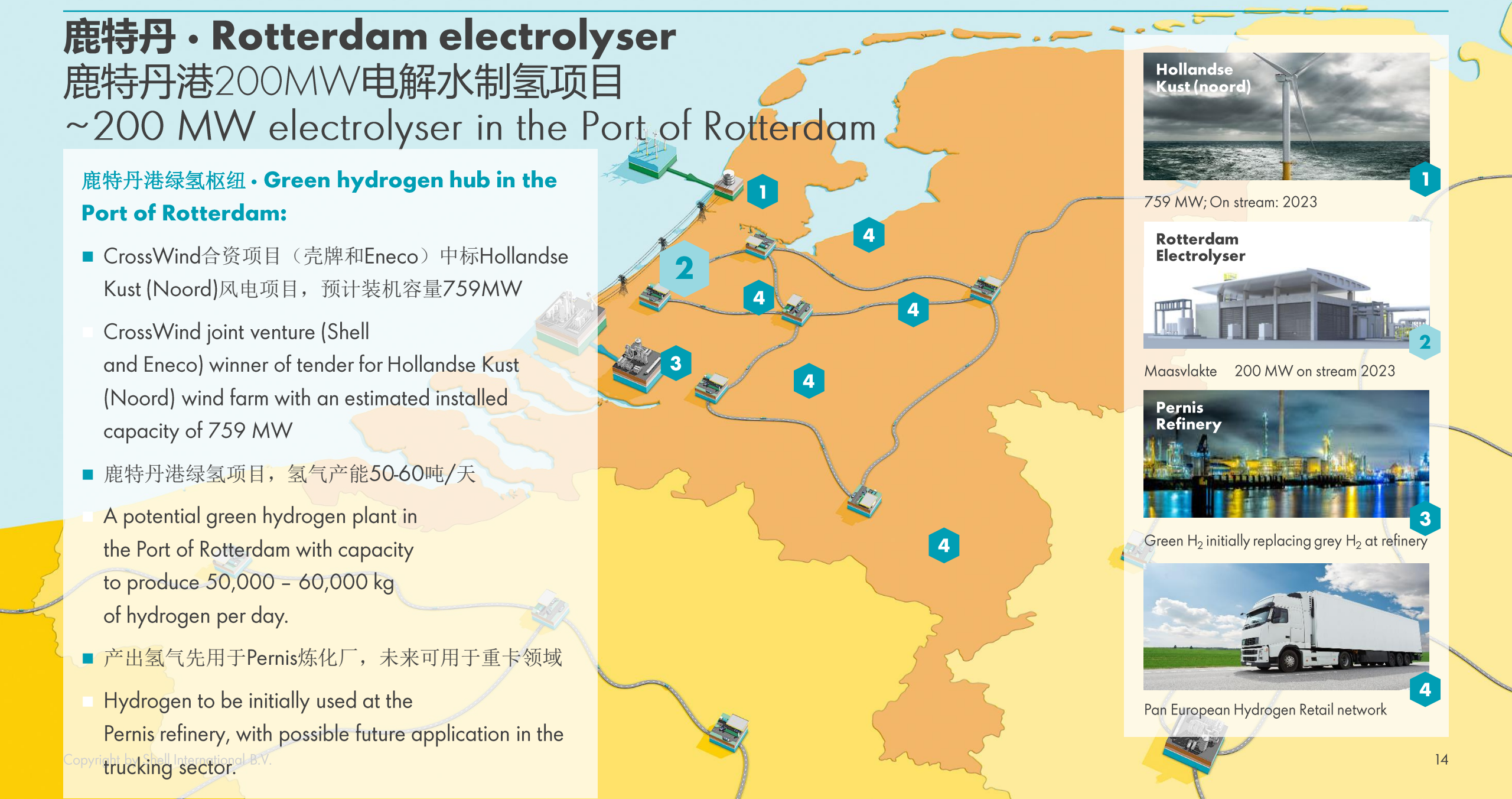
	相关项目 **Proof points**	
第一阶段：满足自用 Step 1 – Own Use	RefHyne - Rhineland Rotterdam Electrolyser	
第二阶段：服务枢纽 Step 2 – Serving the hubs	GZI - Emmen Rotterdam Electrolyser Hamburg	
第三阶段：启动产业集群 Step 3 – Starting the clusters	$NortH_2$ Ingoland	
第四阶段：充分发展 Step 4 – Fully developed	Rotterdam import Hamburg Import	



鹿特丹 · Rotterdam electrolyser
鹿特丹港200MW电解水制氢项目
~200 MW electrolyser in the Port of Rotterdam

鹿特丹港绿氢枢纽 · Green hydrogen hub in the Port of Rotterdam:

- CrossWind合资项目（壳牌和Eneco）中标Hollandse Kust (Noord)风电项目，预计装机容量759MW
- CrossWind joint venture (Shell and Eneco) winner of tender for Hollandse Kust (Noord) wind farm with an estimated installed capacity of 759 MW
- 鹿特丹港绿氢项目，氢气产能50-60吨/天
- A potential green hydrogen plant in the Port of Rotterdam with capacity to produce 50,000 – 60,000 kg of hydrogen per day.
- 产出氢气先用于Pernis炼化厂，未来可用于重卡领域
- Hydrogen to be initially used at the Pernis refinery, with possible future application in the trucking sector.



1

759 MW; On stream: 2023

2

Maasvlakte 200 MW on stream 2023

3

Green H_2 initially replacing grey H_2 at refinery

4

Pan European Hydrogen Retail network

NortH$_2$

欧洲最大氢能项目(格罗宁根)

Europe's largest green hydrogen project in Groningen

- 壳牌参与的联合体于2020年宣布项目启动

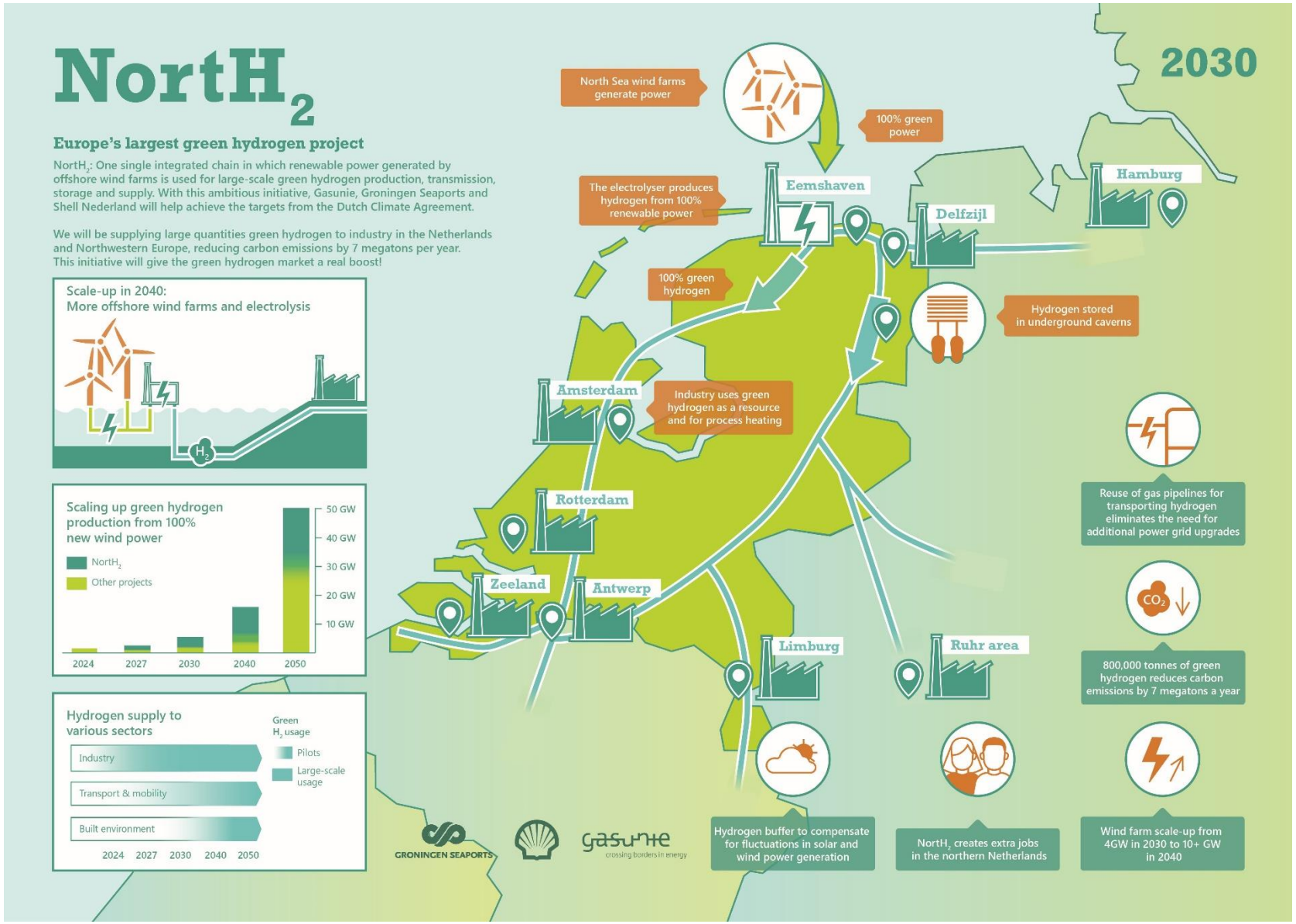
  A consortium of Gasunie, Groningen Seaports, RWE, Equinor and Shell Nederland announced the launch of this project in 2020.

- 使用海上风电的可再生电力生产绿氢（风电预计2030装机3-4GW，2040增加10+GW），绿氢年产能2040年达100万吨，每年可减排800-1000万吨CO2

  The ambition is to produce green hydrogen using renewable electricity generated by a mega offshore wind farm (3-4 GW in 2030, to 10+ GW around 2040). Green hydrogen production ~1Mtonne by 2040. Could avoid 8-10 Mtonnes of CO2/year.

- 项目得到了荷兰格罗宁根省的支持

  This project is supported by the province of Groningen.



可再生电力制氢：**RefHyne** （德国）
建设10兆瓦质子交换膜电解水制氢装置 • Building a 10MW PEM electrolyser

- 壳牌正在德国Rhineland炼厂建设10兆瓦质子交换膜电解装置，该装置是世界最大的同类装置

  Shell is installing a 10-megawatt PEM (polymer electrolyte membrane) electrolyser, the largest of its kind, to produce hydrogen at the Rhineland refinery in Germany

- 探讨与ITM Power合作将项目扩展至100兆瓦的可能性

  Considering possibility to scale up to 100 megawatt in time with ITM Power

- 该项目得到欧盟的支持

  This project is supported by the European Union

REFHYNE
CLEAN REFINERY HYDROGEN FOR EUROPE

张家口合资项目 · Zhangjiakou JV

华北地区产业链一体化枢纽 · Integrated value chain hub for northern China

- 2020年9月，与政府和行业专家合作成立的合资项目

  A newly incorporated joint venture with government and industry experts was established in September 2020

- 建设2万千瓦可再生电力制氢项目，开发高周转量的加氢站网络，服务于城市公交系统

- Develop a 20MW renewable power-to-hydrogen electrolyser plant and build a network of high-throughput HRS serving city buses

- 可在短期扩展至5-10万千瓦规模，以服务快速增长的京津冀区域市场，支持该地区的清洁能源产业发展

- With route to scale for near-term expansion (50-100MW) to serve the fast-growing Beijing-Tianjin-Hebei (JJJ) regional market


H2 electrolyser 1

H2 refilling station 2


H2 fuel cell bus 3

交通领域氢能应用
Hydrogen for transport
强强联合 · Consortia key to make it happen

重型运输业 · Heavy Duty - **H_2Accelerate** - 2020

- 卡车制造商和能源企业合作推进氢能卡车资金和政策支持
  Collaboration of truck manufacturers and energy companies who will work together to help progress funding and policy landscape for hydrogen trucking
- 第一阶段：概念验证，超过20座加氢站，数百辆氢燃料电池卡车
  Phase 1: Proof of concept: > 20 stations, 100's of trucks
- 第二阶段：欧洲推广，欧洲网络覆盖，数千辆氢燃料电池卡车
  Phase 2: European roll out: European network coverage, 1,000's of trucks

合作发起企业 · Founding Partners

VOLVO DAIMLER IVECO SHELL OMV

轻型运输业 · Light Duty - **H_2Mobility** - 2015

- 2021年底前建成100座加氢站网络
  Hydrogen refueling stations network to 100 stations by the end of 2021

合作发起企业 · Founding Partners

AIR LIQUIDE DAIMLER THE LINDE GROUP OMV SHELL TOTAL

壳牌加氢站
Shell hydrogen stations

- 目前，壳牌参与的合资公司H2Mobility在德国运营超过90座加氢站网络，其中37座为壳牌运营

  Today Shell has 37 Hydrogen stations as part of a network of over 90 stations through our joint venture, H2Mobility, in Germany.

- 壳牌在美国加州建有9座轻型车辆加氢站，并且已经获得建设另外48座加氢站的资金

  In California, Shell has currently opened 9 light-duty refuelling stations and has received proposed funding for 48 more.

- 另外，壳牌在美国加州还运营着3座重卡加氢站

  In addition to this Shell have recently opened three truck refuelling stations in California.

- 壳牌作为英国最早的加氢站运营方，从2017年开始在英国运营，目前在营3座加氢站

  Shell was the first branded fuel retailer to sell hydrogen at one of its retail sites in the UK in 2017 and now has three stations in England.

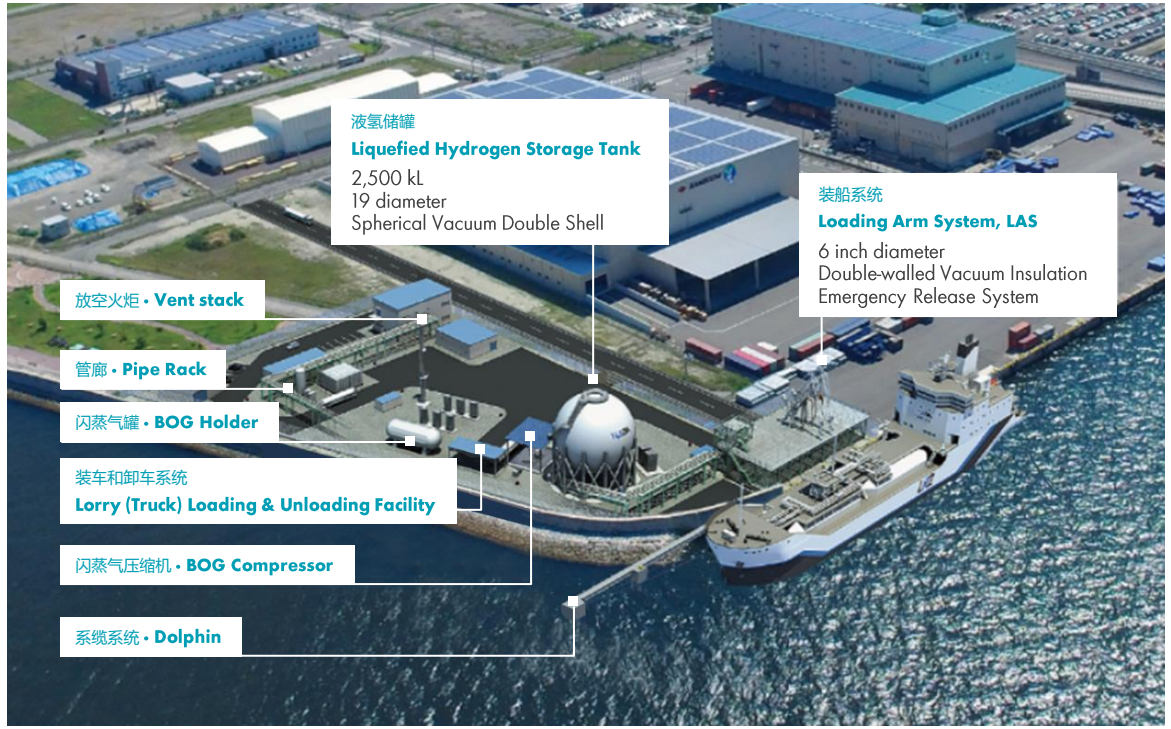
- 壳牌在荷兰的第一座加氢站开业，是规划建设的3座加氢站之一

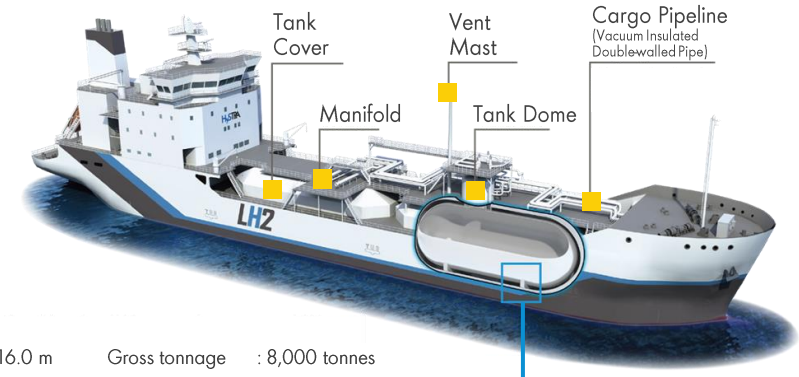
  Shell has opened the first of three planned hydrogen refuelling stations in the Netherlands.

- 同时，壳牌在加拿大运营有2座加氢站

  Shell also has two hydrogen refuelling stations in Canada.

创新氢能运输方式
Developing methods of transport

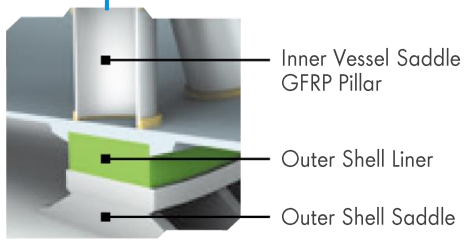




Overall length	: 116.0 m	Gross tonnage	: 8,000 tonnes
Overall length	: 19.0 m	Vessel speed	: 13 knots
Depth	: 10.6 m	Draft	: 4.5 m
Maximum crew	: 25 persons	Tank capacity	: 1.250 kL

Liquefied hydrogen tanks for marine transportation

A vacuum insulated double-walled structure provides ultimate insulation properties. Using glass fiber reinforced plastic (GFRP) for the support structure enables heat transfer to be reduced.



- 壳牌在液化天然气全球运输方面的经验和专业是开发包括液氢在内氢能供应链的关键
  Shell's experience and expertise in transporting liquefied natural gas across the world is key to developing a hydrogen supply chain including for liquefied hydrogen.

- 液氢远期研究 Liquid H_2 long range research
- HySTRA项目 HySTRA project
- 与川崎重工和岩谷合作 Partnership with Kawasaki Heavy Industries+Iwatani
- 启动液氢运输船 End 2019, launch of ship Suiso Frontier (Hydrogen Frontier)

合作是氢能产业成功的关键 Collaboration is key for H2 success

氢能做为一种可持续性交通出行选择，要取得未来成功必须所有从业者的共同行动。

The future success of hydrogen as a sustainable transport option will require actions by all players

车辆厂商 Car manufacturers

持续开发燃料电池汽车并不断降低成本

to continue developing hydrogen fuel cell vehicles and reduce costs

政府部门 Governments

支持使用燃料电池汽车

to support the choice for hydrogen fuel cell vehicles

客户 Customers

更完备的加氢设施以及更多燃料电池车型号可供选择

Greater hydrogen infrastructure and more hydrogen car models to choose

能源产业 Energy industry

投资基础设施并提供具备竞争性的燃料价格

to invest in infrastructure and offer fuel at competitive price