Hydrogen and the Energy Transition Pathway

Henry Rushton
Director, ING Energy Sector Coverage

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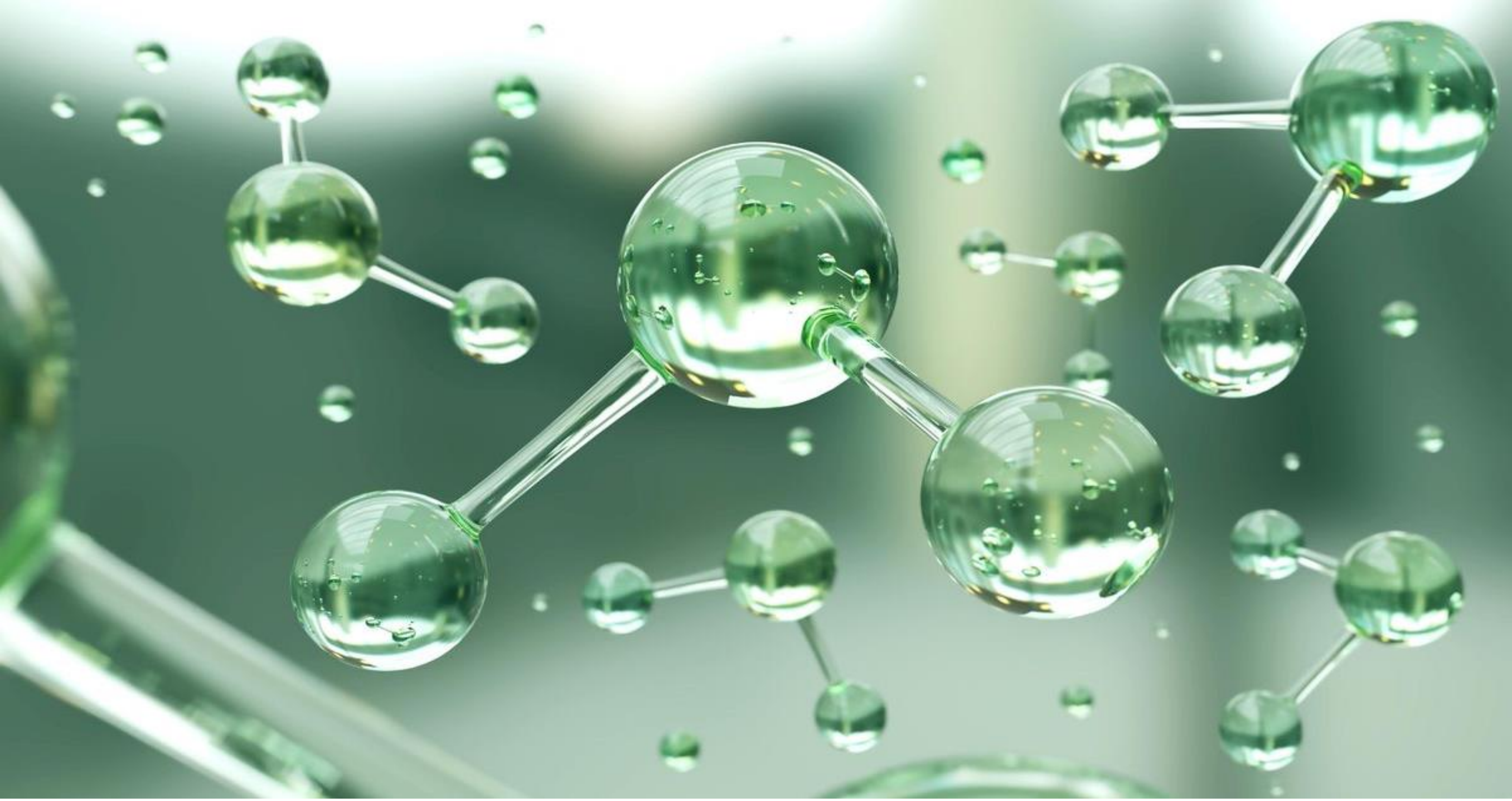
do your thing



1. ING’s approach

Energy Transition is the core of ING's Energy Sector coverage and beyond

Leading the Terra approach

Started in late 2017 in collaboration with:

2° Investing Initiative

PARIS2015 COP21·CMP11

... and in late 2018

The Katowice Commitment

At COP24 in Katowice, four international banks joined ING in pledging to align their loan portfolios with global climate goals. Currently there are over 30 international banks affiliated with this initiative that aims to bring the **balance sheet of banks in line with the well below 2 degrees scenario of the Paris Climate Agreement**

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BNP PARIBAS

BBVA

SOCIETE GENERALE

Standard Chartered

Supporting our client`s transition journey

As a leading global energy bank, ING engages across the value chain

"The global energy system is the main cause of climate change through the greenhouse gas emissions it produces but it also offers the main means to combat climate change and for the future sustainable development of the global economy. At ING, we remain committed to supporting the Energy Transition, and to engaging with clients as they build the business models of a net zero economy. We prioritise an inclusive approach to ensure that all stakeholders move forward together, thereby creating impact in the real economy."

Michiel de Haan,
Global Head of Energy Sector, ING

ING climate action: 5 of 9 sectors are on track with climate alignment pathways

on track	**Power generation**
on track	**Upstream oil & gas**
on track	**Residential real estate**
on track	**Automotive**
on track	**Shipping**
close to on track	**Commercial real estate**
close to on track	**Cement**
close to on track	**Steel**
not on track	**Aviation**

Documenting the progress

ING recently published the 2021 integrated climate risk report

In 2020, ING closed **139** sustainable finance transactions, including supporting the largest ever sustainability-linked RCF for AB Inbev

Renewables account for **64%** of our power generation financing at YE2020.This includes wind solar, water and geothermal.

Began using **100%** renewable electricity in our own buildings in 2020, and reduced carbon emissions by 75% since 2014.

Lending to thermal coal mining has reduced more than **90%** to 30m at year end from 316m in 2017.

Set new target to reduce funding to upstream oil & gas by **12%** by 2025 from 2019, in line with the IEA-NET-zero 2050 scenario.

Our reporting scope for mortgages reached **70%** from 50% by including Poland and Belgium.

Climate risk heatmaps completed for over **83%** of assets in WB.

The COP26 GFANZ is the logical continuation of the transition path that ING already embarked on several years ago.

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New energy technologies – ING is an early adopter

1. Driven by trillions of investments required for new energy technologies to support the **Paris 2°c** pathway and to meet growing energy demand, ING established a strategy to harness innovation and disruption in the energy sector
2. Three emerging technologies have been selected based on research and dialogue with a range of clients on their strategies for embracing the energy transition
3. **To engage and think along with our clients**, build awareness around bankability topics, and identify where ING can add value in realizing their strategies
4. ING has established a €650m lending envelope for new energy technologies including Hydrogen. Further demonstrating our support and commitment to a sustainable future

Hydrogen

- **20% of global CO_2 emissions** from fossil fuels can be eliminated by using hydrogen, the clean-burning molecule that could become a zero-carbon substitute for fossil fuels in hard-to-abate sectors of the economy
- With comprehensive policies, over **US$11trillion of investment will be required** in production, storage and transport infrastructure resulting in annual sales of hydrogen of US$700bn by 2050

Carbon capture & utilisation storage

- **10% of global CO_2 emissions** can be eliminated by using CCUS which captures CO_2, transports and stores in underground geological formations or to be used in various applications
- **More than 2,000 large scale (>0.4 Mt/year) plants need to be built** by 2050 while there are currently only 21 plants operational. IEA estimates that projects nearing FID as of September 2020 represent a total potential investment of ~US$27bn

Energy storage

- Focus on 2 main emerging solutions: Stationary and EV Batteries
- **Stationary:** Investment of c.US$650bn needed to grow production accordingly (investment of c.US$75m/GWh) by 2030 driven by higher renewables penetration into the grid
- **EV Batteries:** US$176bn in investments will be required to scale cell manufacturing capacity from today's 432GWh to the more than 2TWh in 2030

Completed mandates

US — 08/21
RAD Bloom Class B LLC
USD 134m
Finance for the construction of a portfolio of 56 solid oxide fuel cells
Joint Lead Arranger
Energy Renewables & Power

Sweden — 08/20
Northvolt Ett AB
USD 1,360m
Multi-ECA covered senior secured term loan
MLA, Documentation Agent, Insurance Bank, Intercreditor Agent, Facilities Agent, FX Coordinator
Energy Renewables & Power

The Netherlands — 08/20
Porthos
Financial Adviser on a C02 capture, transport and storage infrastructure system in The Netherlands
Financial Adviser
Energy Project Advisory

Canada — 01/22
Ionomr Innovation
USD 15m
Capital raising
Corporate Finance
Energy - Hydrogen

Australia — 12/20
Wandoan South Bess
AUD 107m
Project Finance Facilities for a 100MW/150MWh Battery Energy Storage System
MLA, Hedge Provider, Technical Bank
Energy Renewables & Power

US — 03/19
Sparks Battery Holdings LLC
US$ 136m
Senior Secured Credit Facility
Joint Lead Arranger & Co-Lender
Energy Renewables & Power

Current mandates

Germany — Current
German LNG
LNG import terminal with add-on investment to allow H2 imports
Advisor
Energy Project Advisory - Hydrogen

Europe — Current
M&A Advisory
Minority stake divestment
Undisclosed
Energy Hydrogen

Belgium — Current
Renewable Company A
EUR 25m
Renewable company has mandated ING to arrange financing for its new 25MW battery storage project
Undisclosed
Lead Arranger
Renewables & Power

EMEA — Current
Equity
Hydrogen production plant
Undisclosed
Energy Hydrogen

Nordincs — Current
H2 Project
Project Financing
Undisclosed
Energy Hydrogen

Nordics — Current
Green steel plant
EUR 3bn
State of the art steel factory with largest electrolyser built-in capacity to date
Pathfinder and Documentation bank
Metals and Mining / Hydrogen

Be the partner of choice for our clients to innovate in the energy transition by retaining the relevant knowledge and providing best-in-class solutions into a sustainable future

ING's strong in-house capabilities to offer integrated service on NET's

Combining the strong expertise of a market-leading debt advisory team and an in-house energy technical team, ING brings an integrated, multi- disciplinary advisory service offering to clients' CCUS pursuits

Dedicated H_2 / CCUS Work Group

- ING is **among the first banks in Europe to establish a team of dedicated H_2, CCUS and Energy Storage specialists** under a New Energy Technology platform
- Developing **institutional knowledge on CCUS**
- Harnessing in house expertise in technology & innovation
- Collaboration with specialist product teams to better support ING clients' in financing and advisory needs

In-house Energy Technical Team

- Strong, experienced in-house team of 3 Reservoir Engineers based in Amsterdam with **over 55 years of combined experience**
- **Lead role as Technical Bank in almost all major O&G upstream** financings
- Leveraging **expertise in Geology, Chemical Engineering and Oil & Gas operations** to facilitate ING's New Energy Technology Initiative ambitions including H_2 and CCUS

Energy Project Advisory *

Sector Focus	Coverage Details
Oil & Gas	Upstream, Pipelines, LNG terminals, Refining, Processing and PetChem
Renewables & Power	Gas power plants, Wind, Solar, and other sources of renewable energy
New Energy Technologies	Hydrogen, Carbon Capture (Utilisation) & Storage, Batteries

Service Offering

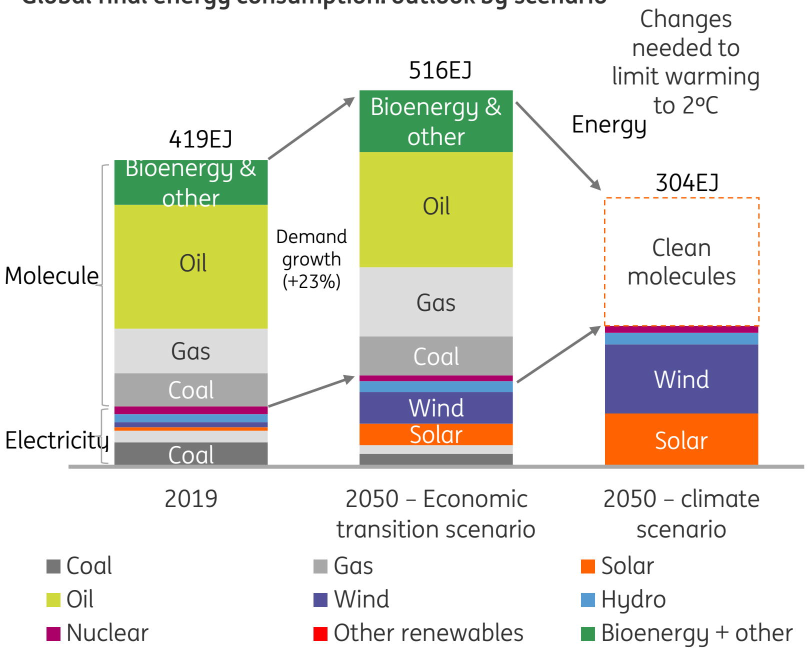
- **One of the largest dedicated debt advisory teams,** working in integrated deal teams with other specialists in the bank when an expanded skillset is required.
- Supporting clients in **all stages of the funding process up to financing close**
- **Identifying the optimum financing structure** to suit the particular stage of the asset's lifecycle, e.g. greenfield or the refinancing of operating assets

* ING was ranked #1 Financial Advisor by IJ Global as of September 2020

The Hydrogen equation: A few figures

Meeting climate targets is likely to require a clean molecule and USD 11trn investment by 2050 if that molecule is hydrogen

Global final energy consumption: outlook by scenario



Source: BloombergNEF 2020 New Energy Outlook

By 2050, the cost of manufacturing hydrogen will be ~ US$1/kg

Steel	Ammonia
US$582 per ton of hot rolled coil (Using coking coal: US$495-US$651)	**US$368** per ton of ammonia (Using natural gas: US$244-US$574)

Cement	Aluminium recycling
US$7 per gigajoule of heat (Using coal: US$1.40-US$4.30)	**US$7** per gigajoule of heat (Using natural gas: US$1.90-US$11.40)

Source: BloombergNEF. Note cost of producing goods using fossil fuels assuming prices of US$60-US$310/t for coking coal, US$2-US$12/MMBtu for natural gas and US$40-US$120/t for thermal coal

The cost of producing Hydrogen in Industry is becoming economically competitive in the mid to long term

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