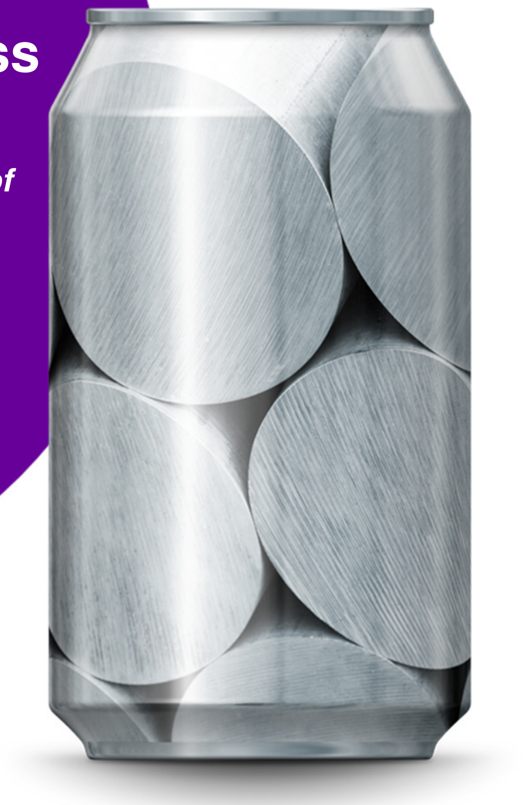
Hydropower as an integrated part of the aluminium business

Arvid Moss, Executive Vice President and Head of Energy and Corporate Business Development

January 17, 2013



01

Hydro’s new platform

Hydro’s path towards global leadership

Curtailing 26% of primary metal capacity

Launching USD 300 program

Announcing SAPA JV

Creating the world’s leading aluminium solutions provider

2009

2010

2011

2012

Starting up Qatalum

Acquiring bauxite and alumina assets

Attractively positioned, global reach

Norway

- 900 000 tpy hydro-powered aluminium production
- Technology centre, R&D for next-generation smelter
- Hydropower developments

Continental Europe

- Leading upstream, midstream and Rolled Products positions
- Recycling network

North America

- Alouette aluminium smelter in Canada, expansion potential
- Remelting

Extruded Products

- 50% ownership in global leader in extruded products*

Brazil

- World-class operations and strong resource base
- Bauxite and alumina growth projects
- Albras aluminium smelter

Middle East

- Qatalum 1 in production
- Qatalum expansion opportunity

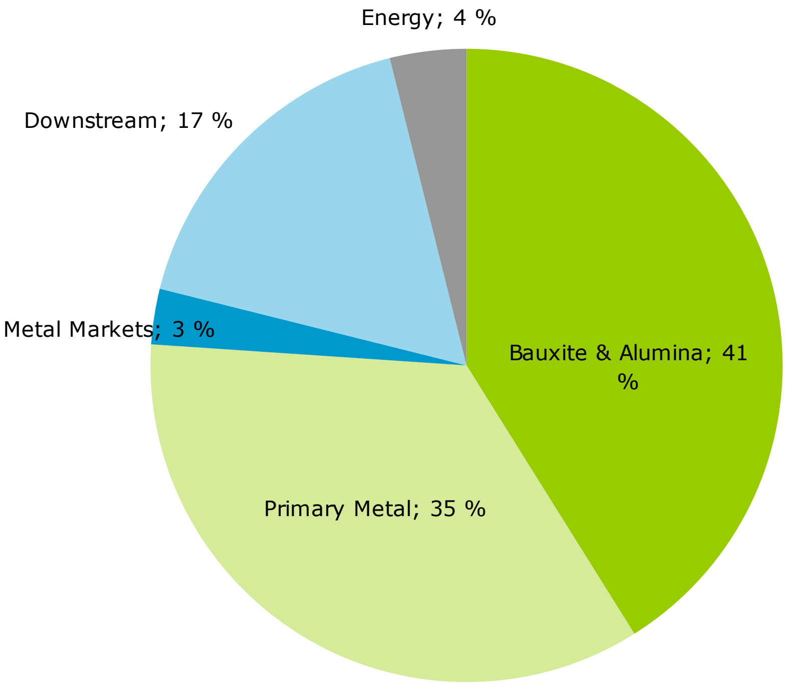
Australia

- Primary aluminium production

* Pending regulatory approval

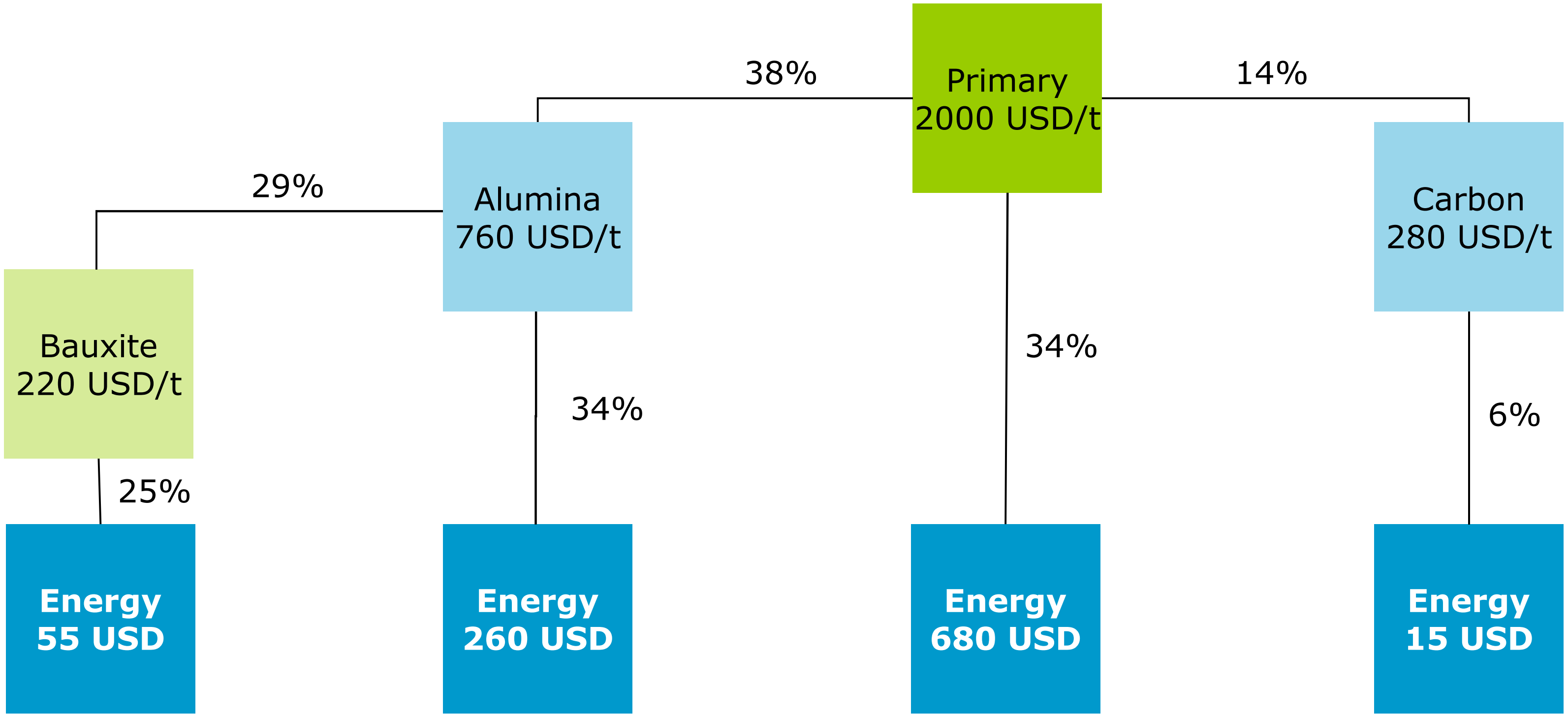
~80% of capital employed upstream

Capital employed[1]



1) Q3 2012, graph excludes NOK 7.9 billion in negative capital employed in Other and eliminations

Aluminium is an energy play



Primary
2000 USD/t

38%

14%

Alumina
760 USD/t

Carbon
280 USD/t

29%

Bauxite
220 USD/t

25%

34%

34%

6%

Energy
55 USD

Energy
260 USD

Energy
680 USD

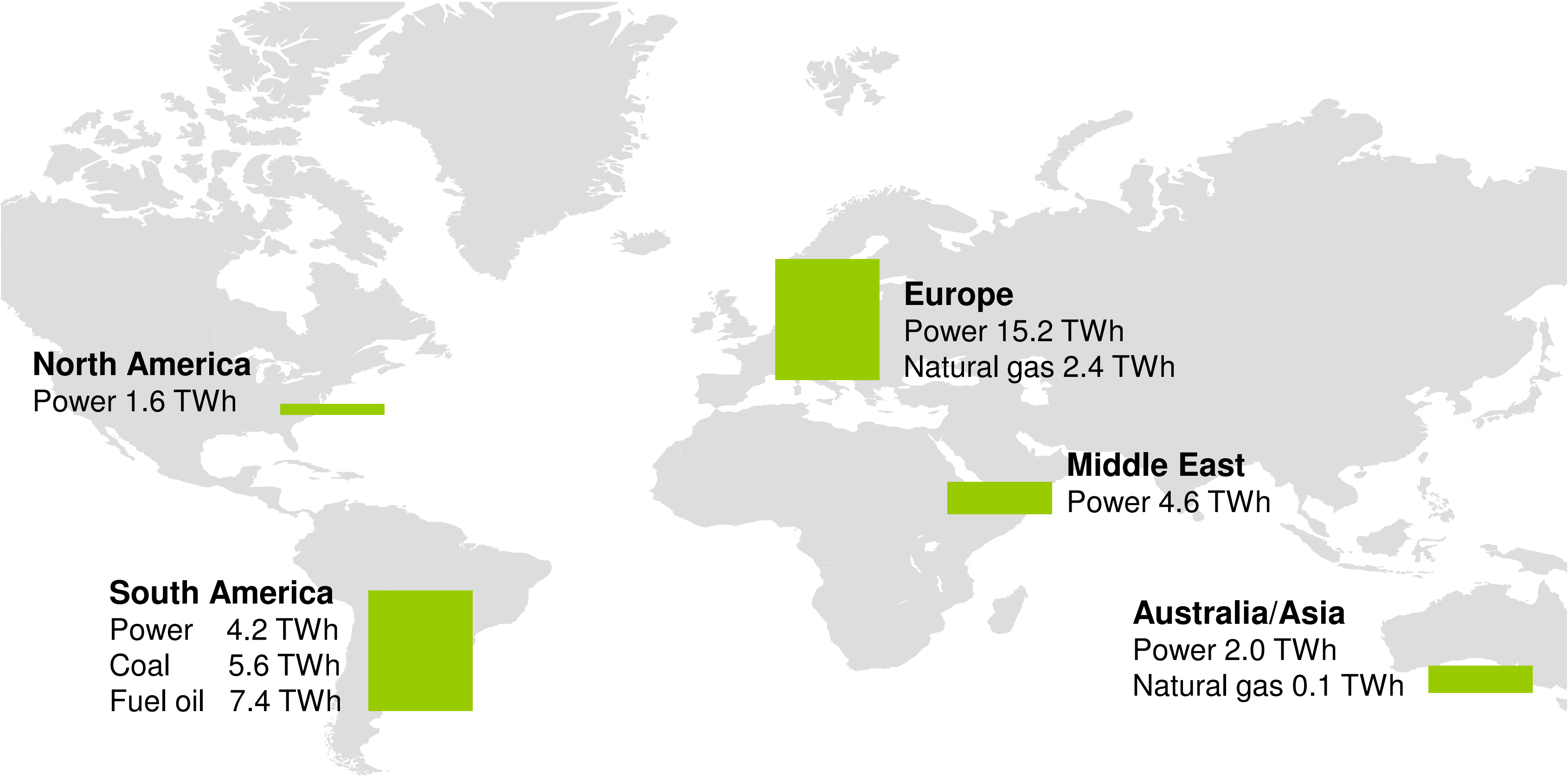
Energy
15 USD

Total energy cost: 1010 USD ~50 %

Illustrative figures
Source: CRU, Hydro Analysis

Hydro's energy map

Energy consumption in alumina refineries, smelters and rolling mills

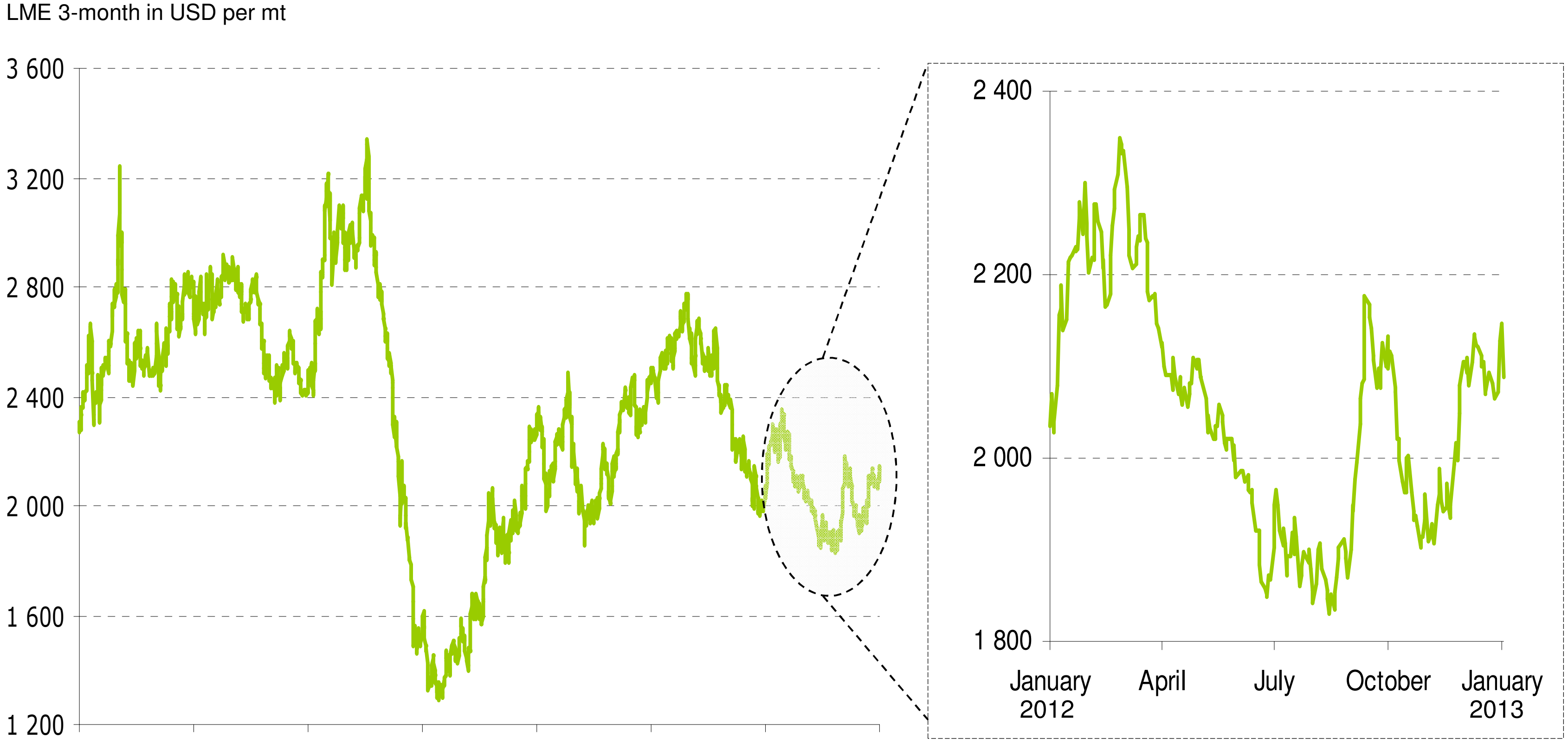


2012 estimate for Hydro's equity production.

02

Aluminium industry from an energy perspective

Aluminium prices reflecting current macro uncertainty

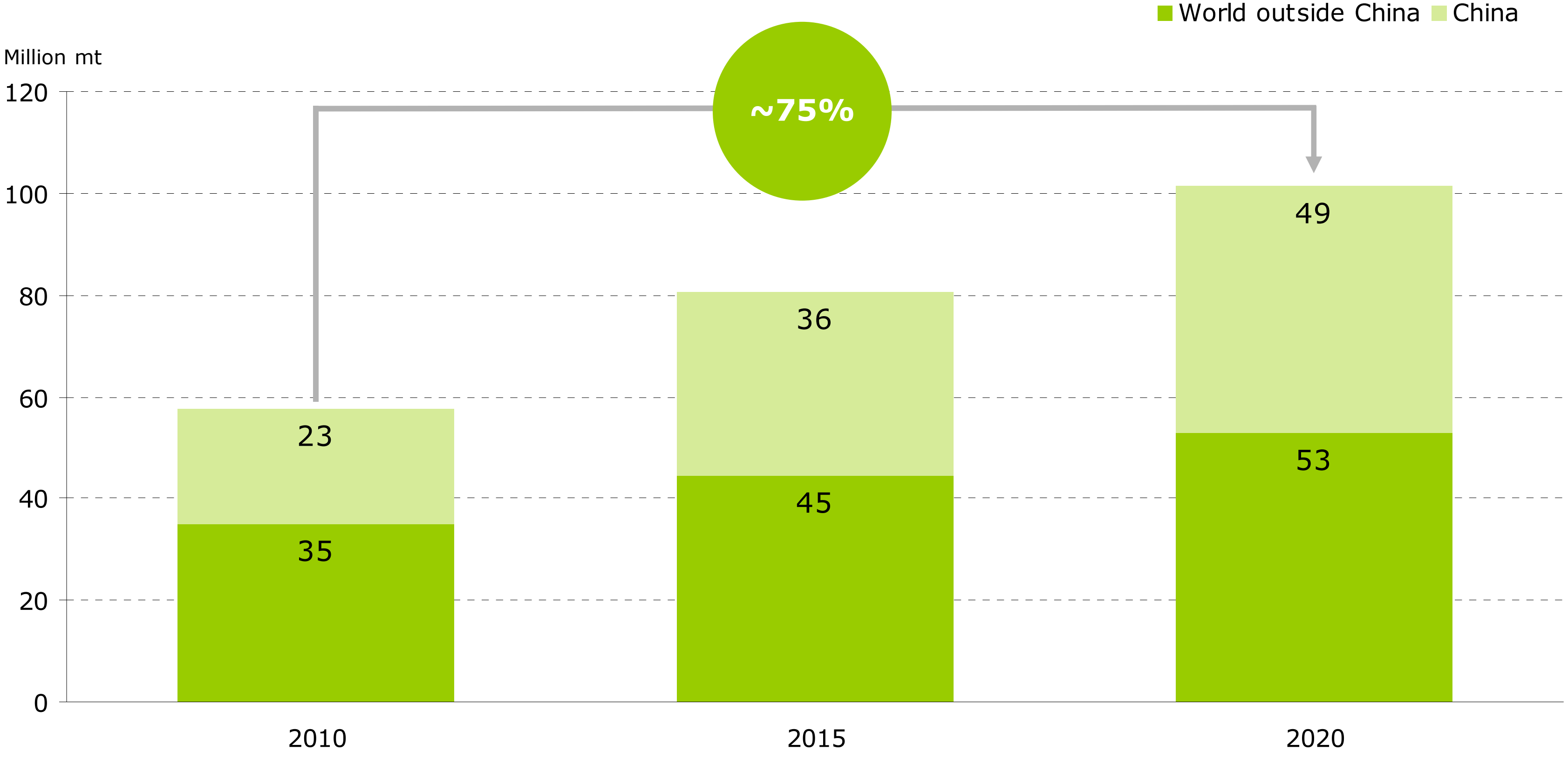


Source: Reuters Ecowin

Long-term outlook remains encouraging

Aluminium production will require much more energy in the future

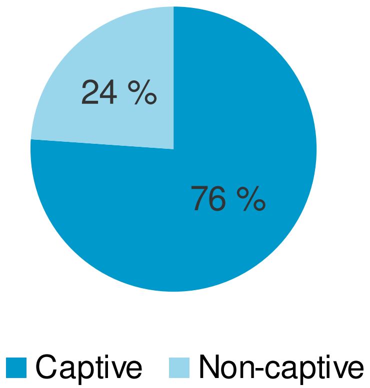
Demand for semis



Source: CRU

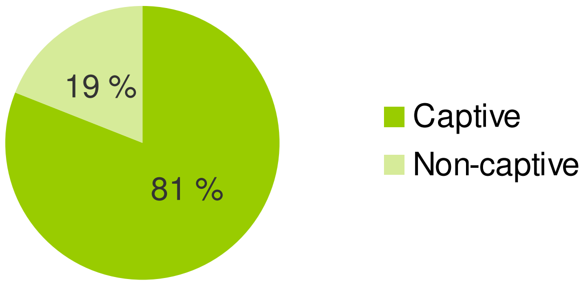
New capacity mostly based on captive power sourcing

Greenfield and major brownfield expansions since 2000*



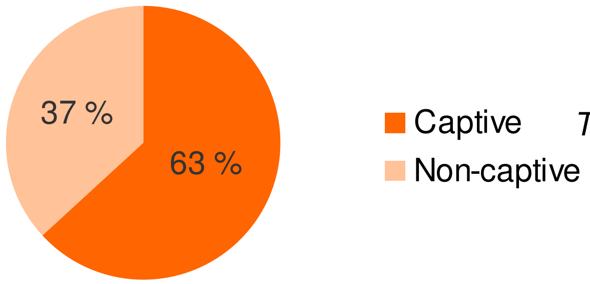
Total new expansions:
8,14 mt

Greenfield expansions



Total new expansions:
5,87 mt

Major brownfield expansions (additional production since 2000)



Total new added production:
2,27 mt

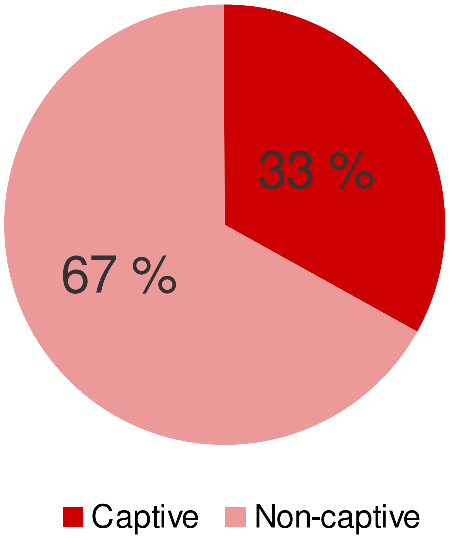
Source: CRU

**) 45 % natural gas, 33 % coal, 22 % hydropower*

Greenfield projects are to a much larger extent based on captive power sourcing compared to older capacity

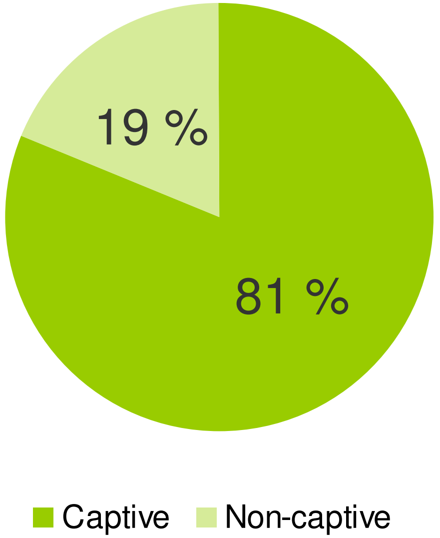
Total primary production World ex. China 2012

Power sourcing



Greenfield primary expansions after year 2000

Power sourcing



Gaining access to captive power sourcing appears to be of strategic importance for greenfield projects.

Source: CRU

03

Hydro and the future of the Nordic power market

Hydro's value chain in Norway

From hydropower to primary metal to products the world is demanding

Telemark

3,0 | 0,5

No reversion | 2044-2049

Sogn

3,2

2051-2057

Røldal-Suldal

2,8

2023

+

Stakraft 6,4 TWh (2000-2020)

Export

Norway export much more energy in solid state

Export for consumtion vs. value-adding

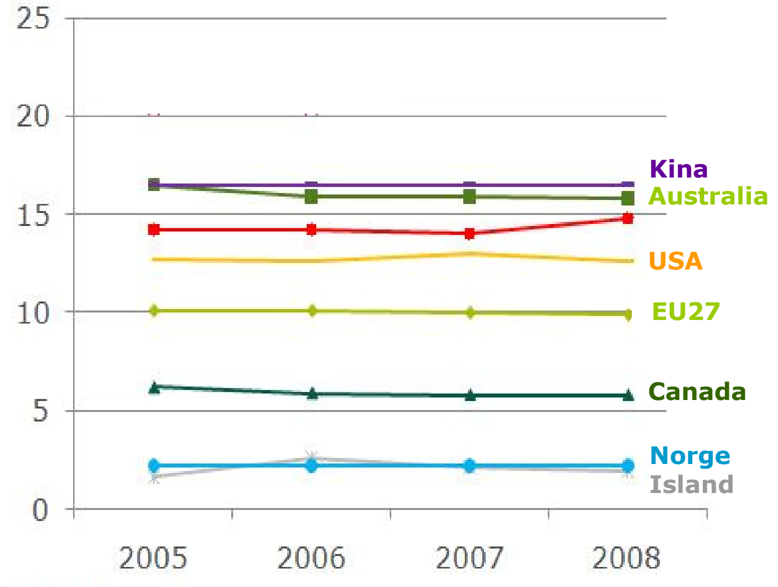
Norwegian net export of hydropower through cables: ~3 TWh/year

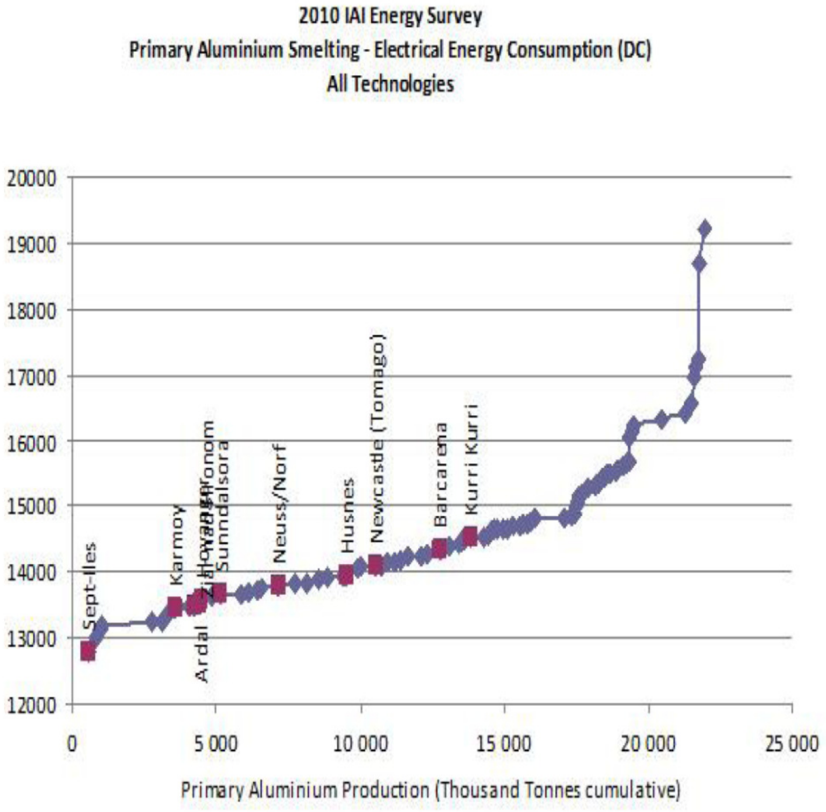
Norwegian export of hydropower through aluminium: 15-20 TWh/year

Energy and climate in a global perspective

Carbon footprint should become key location factor in the future

In tonnes CO2-equivalents per tonne aluminium



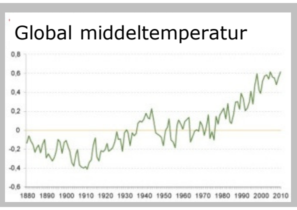


Source: Institut für angewendte Ökologie (Öko-institut e.V.), 12.5.2011

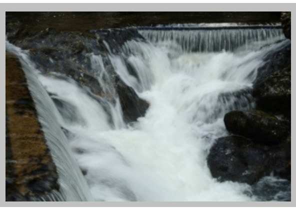
Nordics turn towards considerable surplus

4 key developments

Climate change
Warmer, wetter, wilder– more hydropower, less consumption for heating

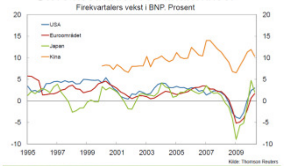


New renewables
Green certificates result in increased production from wind and hydro



Increased nuclear power production in Sweden and Finland

Energy-efficiency measures and weaker economic growth rate



Consequences

Considerable surplus in the Nordic power market

⇓

Drop in power prices

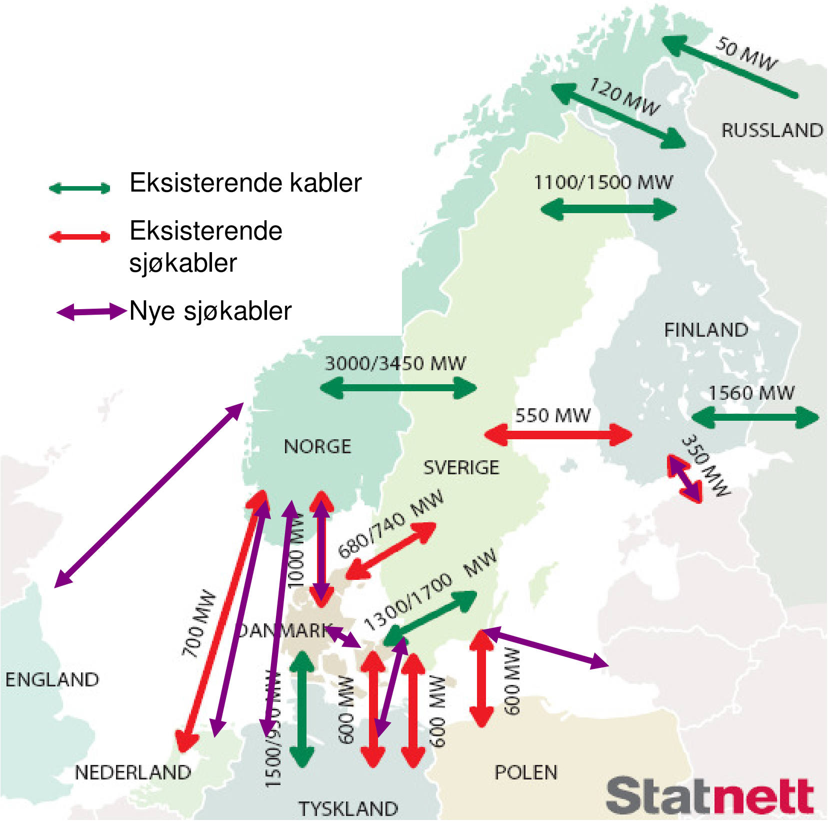
⇓

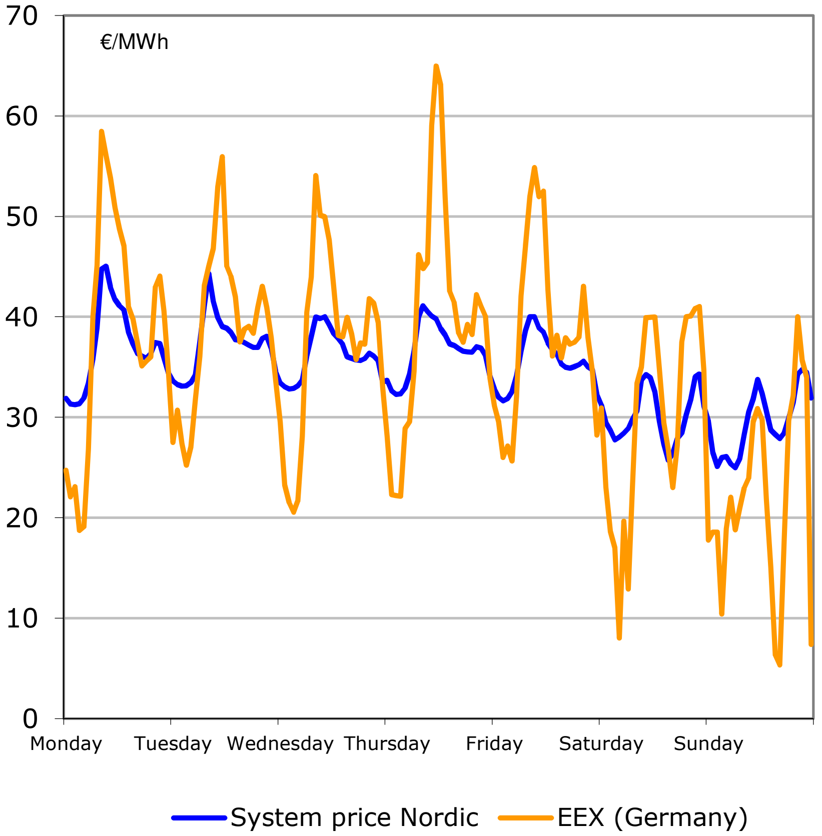
Less industrial activity and bigger drop in power prices
vs
more aluminium production and smaller fall in power prices

Interconnectors are no one-way street…

Power flows both ways in accordance with supply and demand

Considerable focus on interconnectors… **…but power will flow both ways**



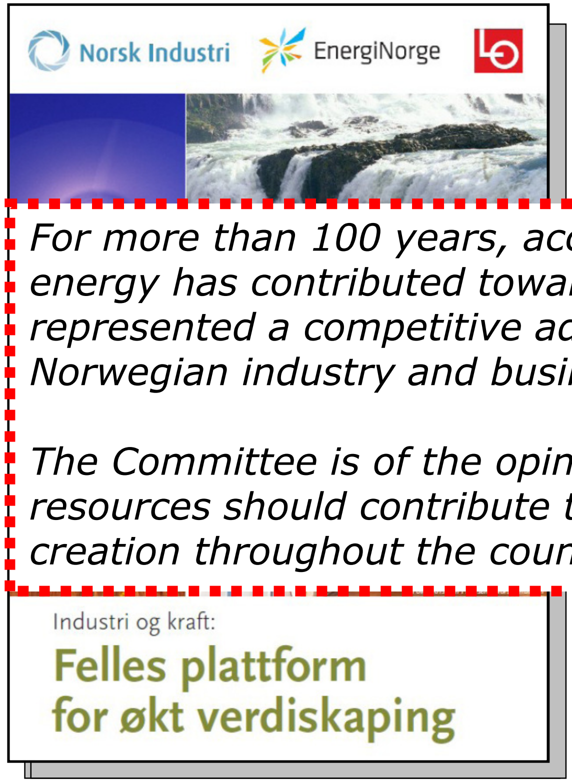


Clear relation between export-import and price changes

Price difference between Norway and Germany, and export from Norway and Sweden in % of capacity

Growing consensus among key stakeholders

’Energy Dialogue’, Energy Panel’, ’Energy Government Report’

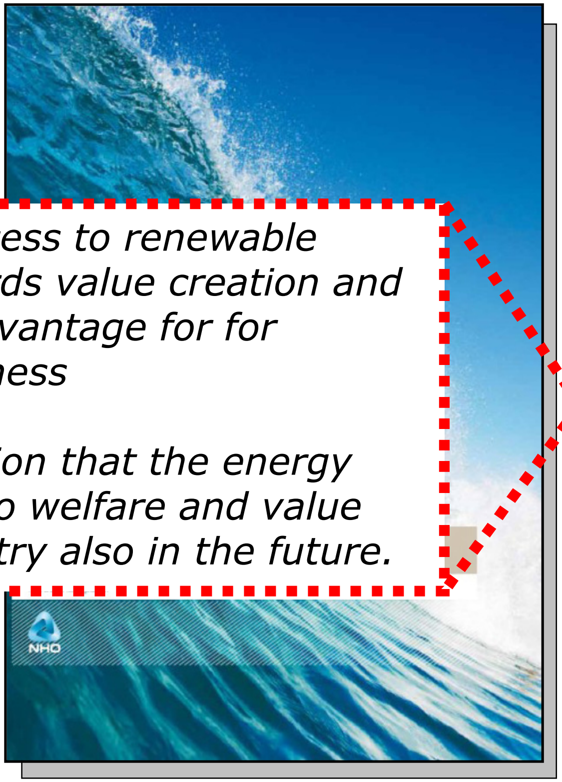


Norsk Industri

EnergiNorge

Industri og kraft:

Felles plattform for økt verdiskaping



(Foreløpig utgave)

NOU Norges offentlige utredninger 2012: 9

Energiutredningen

Verdiskaping, forsyningssikkerhet og miljø

Foreløpig utgave

For more than 100 years, access to renewable energy has contributed towards value creation and represented a competitive advantage for for Norwegian industry and business

The Committee is of the opinion that the energy resources should contribute to welfare and value creation throughout the country also in the future.

HYDRO

Different industries, common cause

Nordic EII's and the energy sector have a joint challenge – and opportunity

www.hydro.com