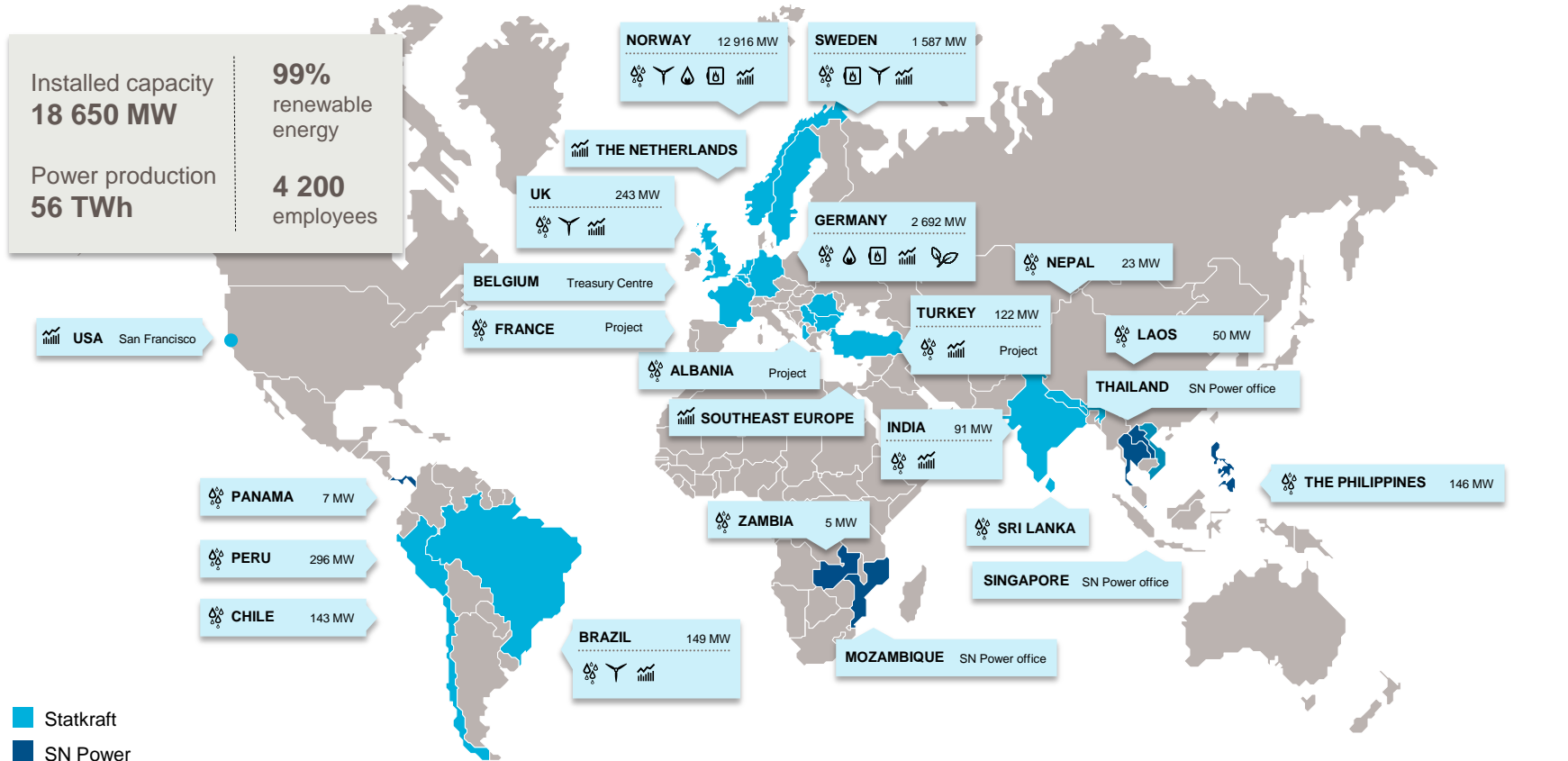




***AN INDUSTRY PERSPECTIVE ON  
CHALLENGES IN MODELLING POWER  
MARKETS BEYOND CURRENT POLICIES***

# Introduction to Statkraft

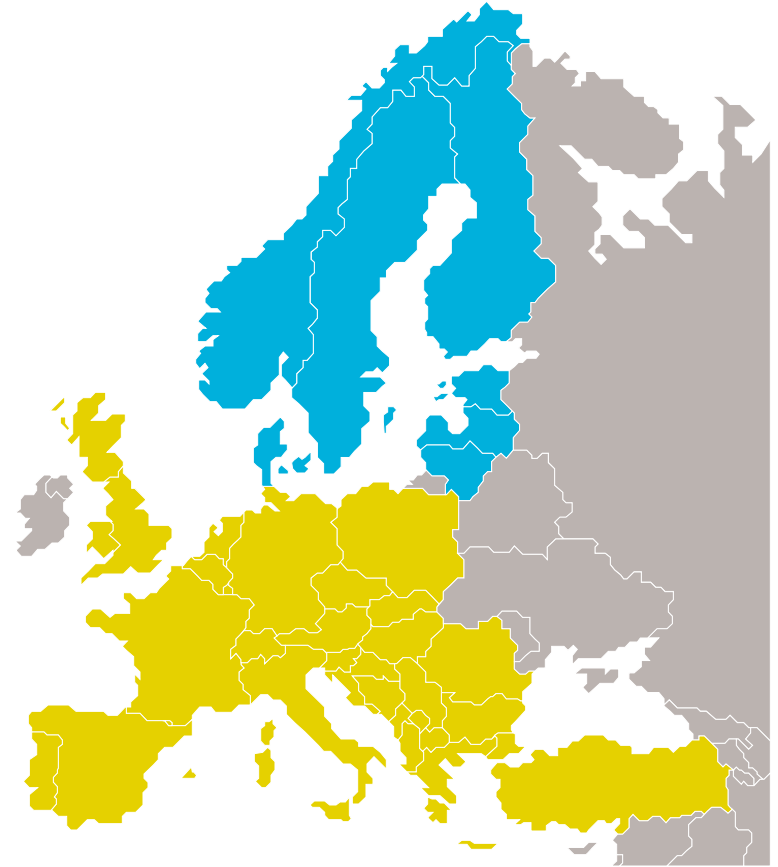


# An industry perspective on challenges in modelling power markets beyond current policies

- ▶ What models do we use?
- ▶ What time horizons do we look at?
- ▶ What are long term prognoses used for?
- ▶ Dispatch focused models versus energy focused models
- ▶ Key factors considered in capacity changes
- ▶ Many challenges remain...

# What models do we use?

- ▶ Nordics and Baltics
  - Hydropower dispatch focus
  - Detailed modelling with *EMPS* developed by SINTEF
  - New capacity added through in-house models
- ▶ Continental Europe, Great Britain and Turkey
  - Thermal dispatch focus
  - Detailed modelling with *ProSym* now part of ABB
  - New capacity added through in-house models



# What time horizons do we look at?

## Short Term

- Power system largely known and static composition
- Main uncertainties: fuel prices, demand and weather

## Medium Term

- Power system dynamic yet defined by current policy
- Main uncertainties: power system development, fuel prices and climate

## Long Term

- Power system dynamic and policy largely unknown
- Main uncertainties: energy policy, technology development

# What are long term prognoses used for?

## ▶ Strategy

- Which markets are most attractive, which are a dead end?
- Examples: Enter the energy services market in X. Exit gas fired generation in Norway.

## ▶ Investment and divestment decisions

- Will a power plant earn more than it costs to build?
- Examples: Merchant plants and plants under the UK's CFD

## ▶ Long term contracts

- What should be the price for contracts with longer horizon than the market?
- Examples: 10-20yr Power Purchase Agreements, industrial supply contracts

## ▶ Valuation of the company

- Setting a value of future income helps define how much can be borrowed and invested

# Dispatch focused models versus energy focused models

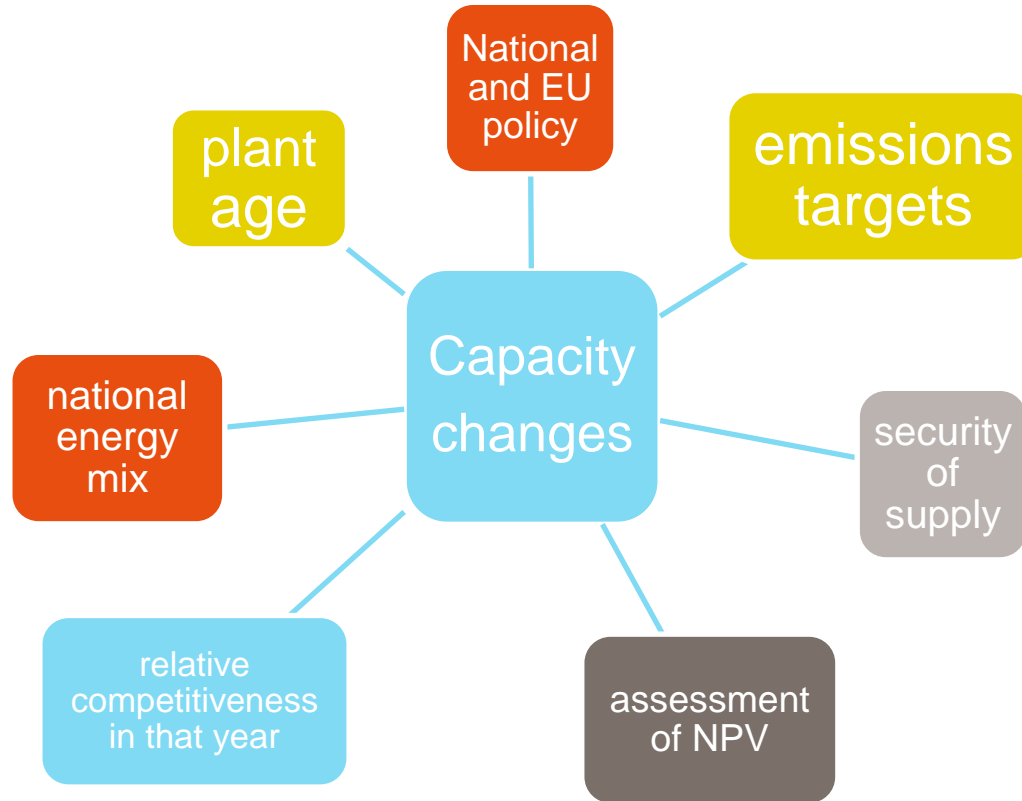
## Market Simulation

- ▶ Focus on dispatch of power plants and price profiles
- ▶ Requires: External calculation of energy system development or iterative process
- ▶ Best for: “Precise” running patterns of plants and prices

## System Optimization

- ▶ Focus on energy System cost optimization based on technological and environmental constraints
- ▶ Requires: Assumptions on technology cost, policy etc.
- ▶ Best for: “Optimal” energy system configurations

# Key factors considered in capacity changes





# Many challenges remain...

Policy:

Which low emissions techs will be favoured?

Technology:

What will be available in 10yrs time?

Water:

How will climate change affect hydropower?

Transport:

How fast will uptake of electric cars happen?

Heating:

What will replace gas in the heating sector?



# THANK YOU

Oisinpatrik.tummon@statkraft.com



**Statkraft**  
PURE ENERGY

[www.statkraft.com](http://www.statkraft.com)

# Statkraft in the UK

- Power generation
- Under development
- Trading activities

