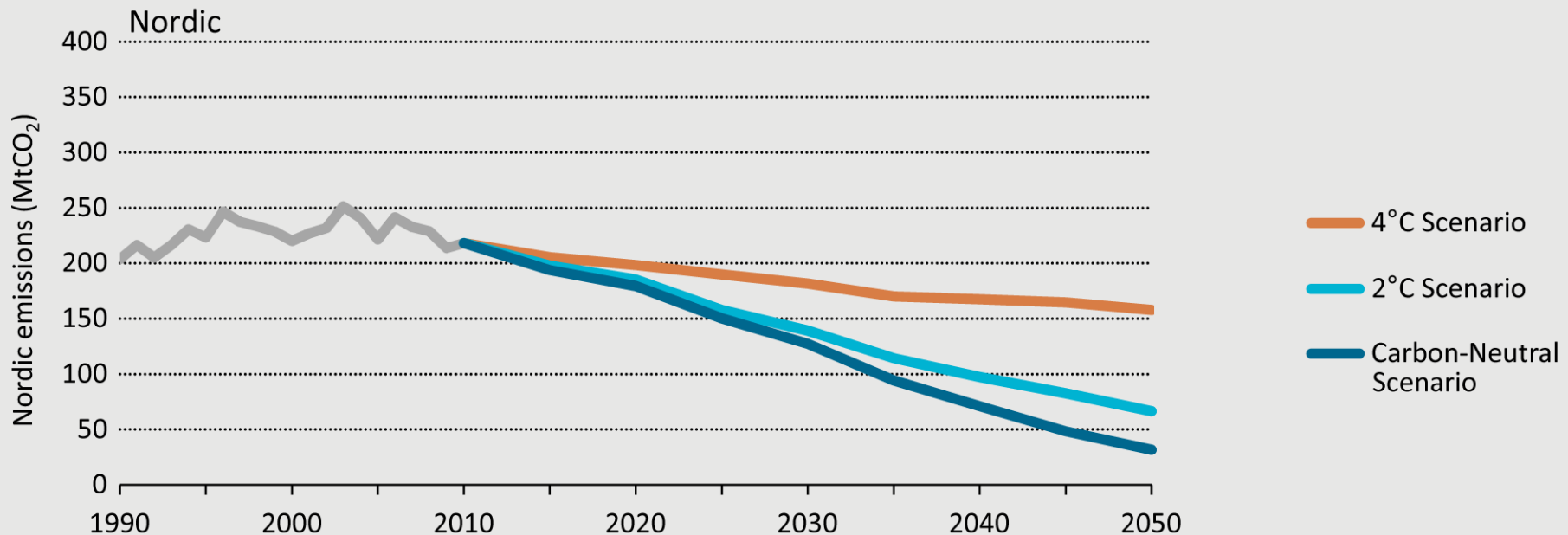


# Assessing the potential for Nordic Energy Technology Perspectives 2

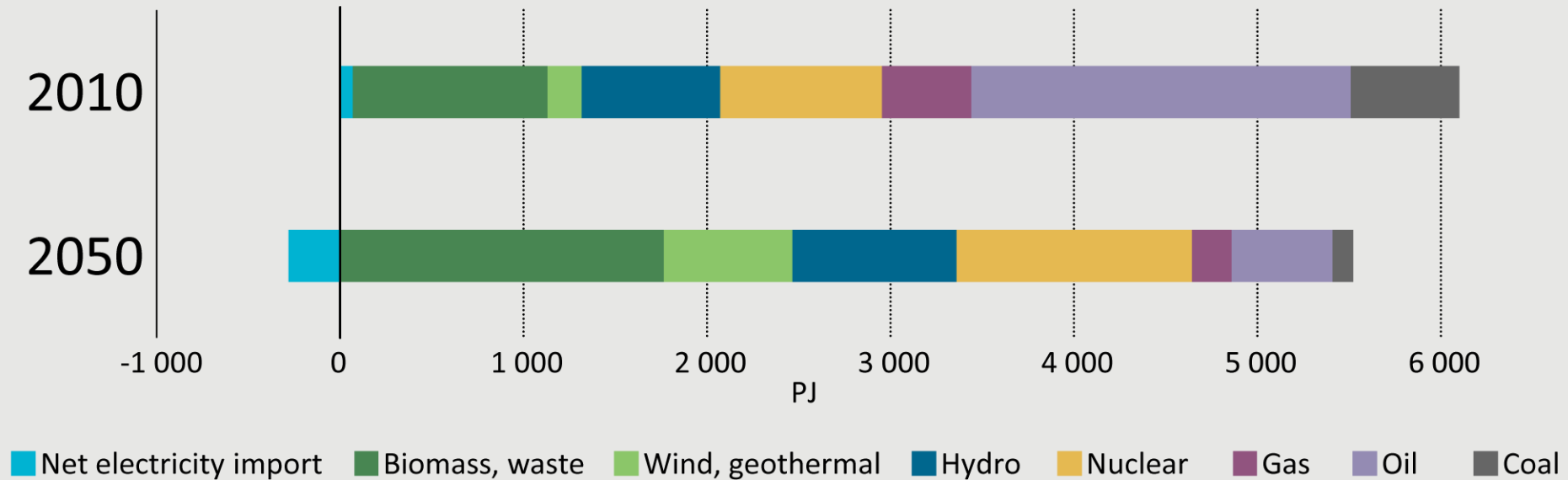
Background information +  
Questions for discussion

# Nordic energy-related CO<sub>2</sub> emissions



NETP presented three Nordic scenarios based on the IEA's global 4C and 2C scenarios. The Carbon Neutral Scenario describes an 85% reduction from 1990, representing national climate goals for 2050, in a world heading for the global 2C scenario.

# Nordic total primary energy supply



In the Carbon-Neutral Scenario - the main scenario for NETP - biomass replaces oil to become the largest energy source, while growth in wind power contributes to net electricity export in 2050.

# Key challenges



Energy  
Efficiency



CCS



Infrastructure



Biomass  
Supply

NETP identified the four challenges above and Nordic cooperation as the key challenges to address

# Controversial results from NETP 1

- Significant net electricity export in 2050
- Industrial activity level in 2050 in line with today
- Net biomass import in 2050
- Nuclear power in Sweden and Finland
- CCS in industry

# NETP1 goals

1. To provide a common reference document for energy technology policy-making
2. To profile the Nordic region as a leader in low-carbon energy system transition
3. To strengthen Nordic research competencies

# (tentative) NETP2 goals

1. Develop Nordic research competencies and cooperation in energy system modelling
2. Provide research-based assistance to Nordic decision-makers in realising the opportunities identified in NETP2013
3. Share knowledge to inform decisions on decarbonisation outside the Nordic region



# IEA's plans for the global ETP

- An annual, more streamlined physical publication with detailed analysis online
- Published in May with 18-month production process
- A focus area for each year

The Nordic ETP should tie into this work

# Organisation

## NETP1

2011									2012									2013								
Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Des	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Des	Jan	Feb	Mar			
			calls					planning analysis								review					launch					
approval							kickoff							analysis						layout, printing						

## NETP2 (tentative) – a longer process

2014												2015												2016					
Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Des	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Des	Jan	Feb	Mar	Apr	Mai	Jun
			calls					planning analysis												review							launch		
approval							kickoff				analysis												layout, printing						

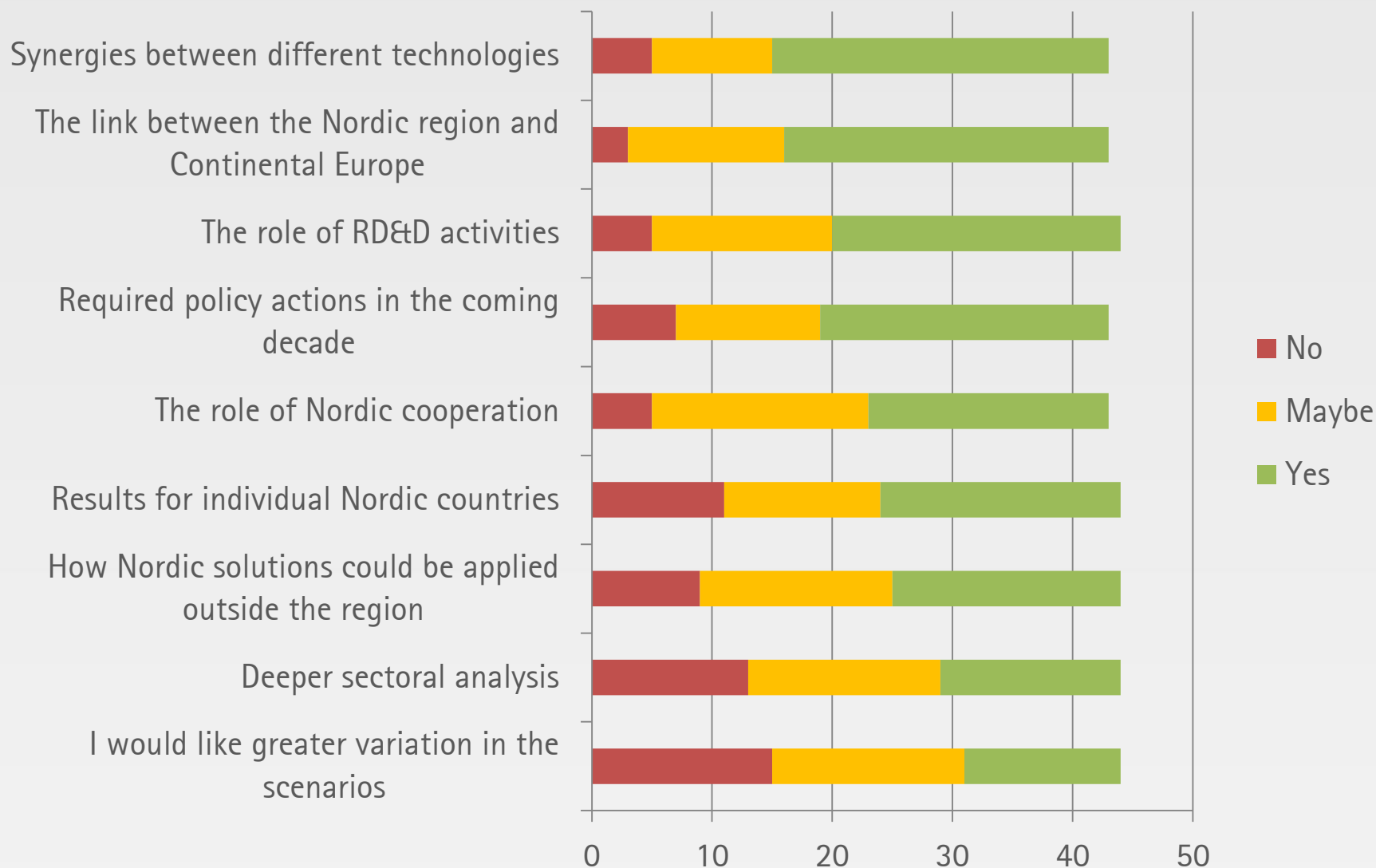


## NETP 2013

## NETP 2016 (tentative)

<b>Scenarios</b>	Sector-based scenario results. High-bio and electricity variants	More streamlined sector-based results. New variants to cover futures for nuclear, industry, etc
<b>Indicators / overview</b>	Overview of Nordic energy system and key energy technology policy measures	Less overview. Tracking indicators to show progress relative to scenarios. Greater EU policy overview
<b>Recommendations</b>	Key challenges identified, necessary actions discussed	More detailed information on necessary financing, infrastructure and instruments in the short-term
<b>In-depth analysis</b>	Sector-based analysis, supplemented with cases based on existing external analysis	More focus on in-depth analysis of specific issues relevant to achieving the scenarios. Greater use of external models.

# Evaluation: External stakeholders: Which areas would benefit from deeper analysis?



# Compatibility of potential in-depth areas with global ETP (bigger = more compatible)

- Synergies between different technologies
- The link between the Nordic region and Europe
- The role of RD&D activities
- Required policy actions in the coming decade
- The role of Nordic cooperation
- Results for individual Nordic countries
- How Nordic solutions could apply outside region
- Deeper sectoral analysis
- Greater variation in the scenarios

# Potential In-Depth Area A.

## Urban system integration

- What is the potential for synergies in electricity between electric mobility, distributed generation and buildings? Or in heat between industry, district heating and buildings? How can we realise them?
- How can city planning and changes in community structures affect transport energy use?
- How can NETP2013's assumptions for dramatic modal shifts in transport towards rail and public transport be realised?
- How will the transport system need to develop in cities compared to less populated areas?
- What is the potential for distributed generation in cities?
- How can energy efficiency renovations in buildings be accelerated?
- What are the lessons from the Nordic region in for example city planning and electric vehicle roll-out?

(based on input from Swedish, Finnish, Icelandic workshops)

# Potential In-Depth Area B.

## Nordic green battery

- What and where are the necessary investments in transmission and distribution infrastructure, both within the Nordic region and outside? What is the cost of delay?
- What will be the effect of a full or partial nuclear phase-out on the Nordic system? What will be the additional infrastructure needs in replacing the nuclear base load with variable renewables? How could this transition play out? What will the effect be on balancing and export?
- What effect will different Nordic and Continental electricity prices have on balancing and export? What is the optimal level of renewables?
- How would costs and benefits be distributed across society and across time? What are the institutional obstacles?
- What is the balancing potential of demand response, or storage in district heating and the electric vehicle fleet?
- What would be the effect of an Icelandic interconnector?
- How can social acceptance affect this transition to the Nordic region being a green battery, what are the lessons from the Nordic region, for example with Danish wind or Norwegian transmission lines?

(based on input from Swedish, Finnish, Icelandic workshops)

# Potential In-Depth Area C.

## Industrial futures

- What are possible developments in electricity prices and what effect would this have on the competitiveness and eventual structure of Nordic industry?
- What effect would a significant change in industrial structure have on the rest of the energy system?
- What is the effect on global emissions of producing energy-intensive products in the Nordic region compared to places the industry is likely to move?
- How can process-related emissions be addressed? What if CCS is delayed?
- Which energy efficiency improvements should be tackled first?
- What are the Nordic lessons?

(based on input from Swedish, Finnish, Icelandic workshops)

# Potential In-Depth Area D.

## Sustainable biomass

- What are the options for utilization of the Nordic domestic potential? How should it be prioritised?
- How sustainable would a maximum utilization of Nordic biomass be compared to imports? What are the total emissions including land use changes and other factors?
- What are the synergies and interdependencies between biomass, industry and transport?
- What is the potential of advanced biofuel technology?
- What are the Nordic lessons from for example integrating paper, pulp and biofuel production?

(based on input from Swedish, Finnish, Icelandic workshops)

# Discussion

1. How can a second NETP improve on the first?
2. What are the key areas of analysis most relevant for [country] ?
3. Which [national] solutions are other countries most interested in? How can they be included?
4. How can we make it more accessible/useful for decision-makers? How will the timing fit national processes?
5. How should a second project be organised vis-à-vis NETP1?