

# Synthesis of Results and Derivation of Best Practice

## GreenNet-Incentives

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# Agenda

1. Renewables and Energy Efficiency in the EU27+
2. Identification of integration issues
3. Overview Facets of RES-E integration
4. Barriers
5. Example barriers
6. Suggested "Good Practice"



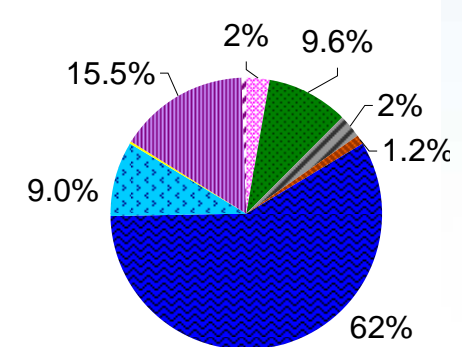
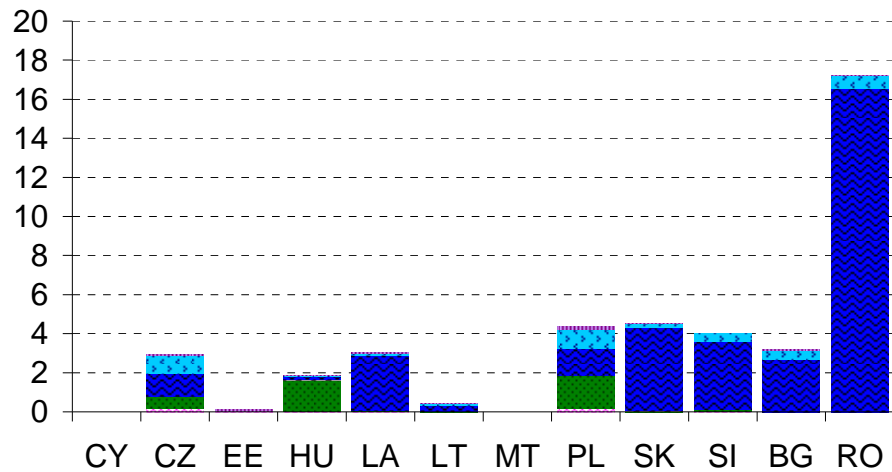
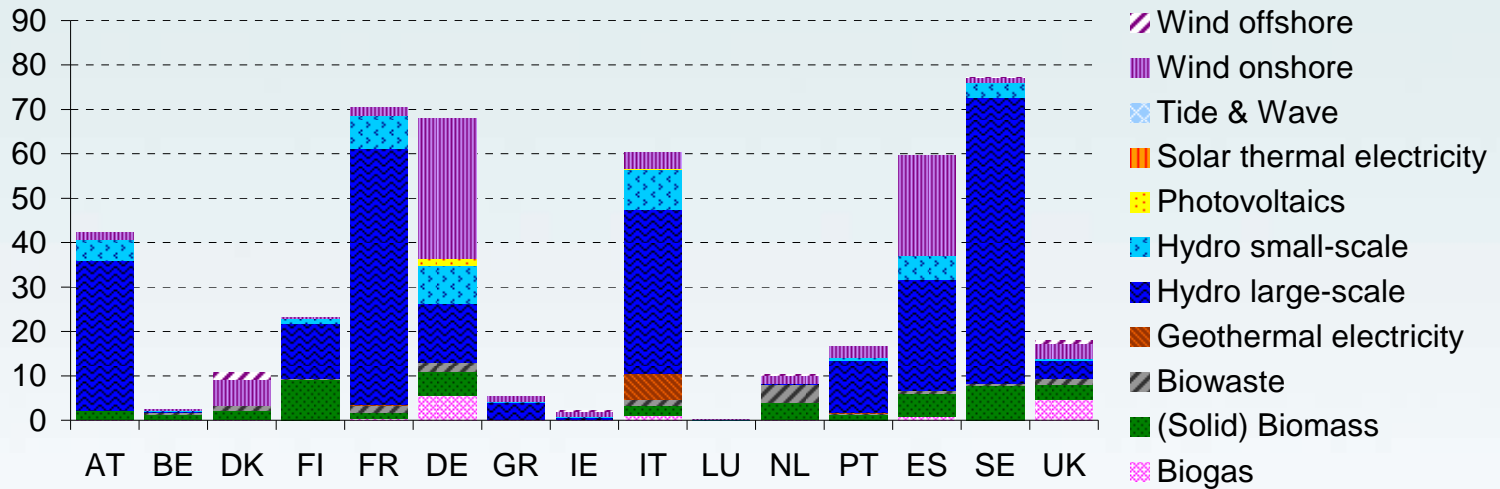


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# Renewables in the EU27+

Achieved RES-E potential 2005 [TWh]



EU-27 total RES-E breakdown 2005

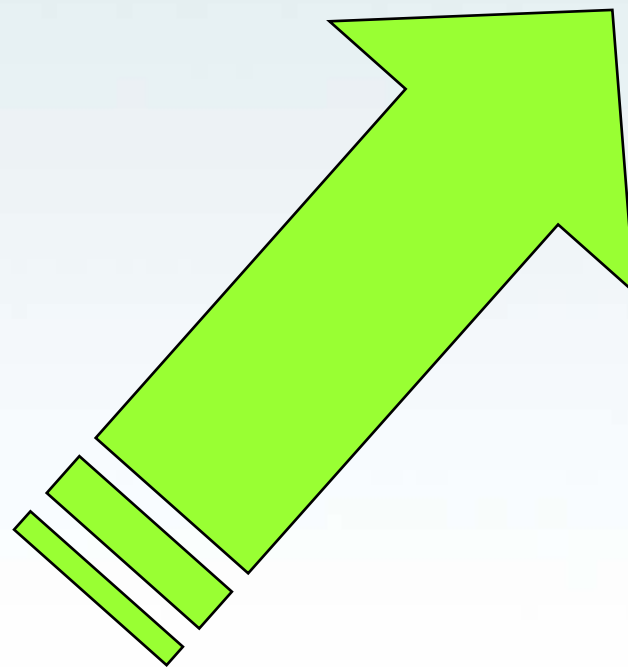
Source: Energy Economics Group



# Renewables Potential in the EU27+

Largest potential for RE in

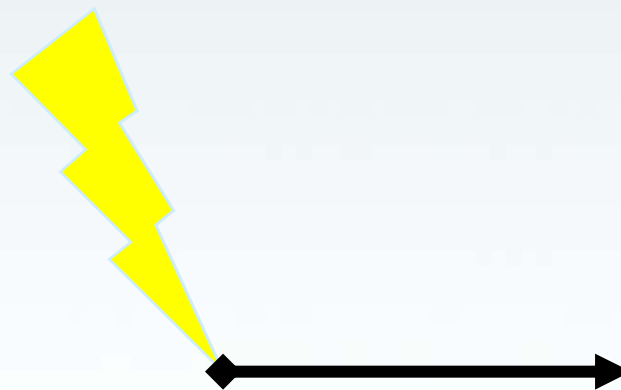
- France
- Germany
- United Kingdom
- Spain
- Italy



# Renewables Potential in the EU27+

## Technologies with largest potential

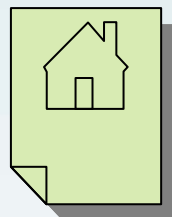
- Wind onshore
- Wind offshore
- Marine technologies
- Photovoltaics
- Biomass
- Biogas



# Energy Saving Potential in the EU27+

## Highest potential in Residential Sector

1. Heating
2. Lighting



## Highest potential in Industrial Sector

1. Electrical motor drives
2. Lighting



## Highest potential in Tertiary Sector

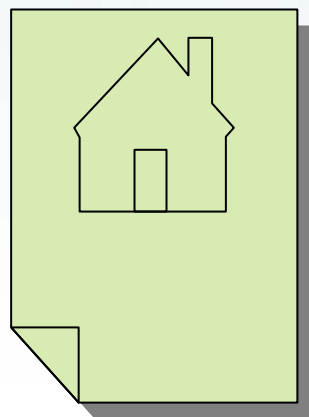
1. Lighting



# Energy Saving Potential in the EU27+

## Countries with highest potential in Residential Sector

- France, Germany, UK, Italy, Sweden, Norway





# Energy Saving Potential in the EU27+

## Countries with highest potential in Industrial Sector

- France, Germany, UK, Italy, Sweden, Norway, Poland, Romania



# Energy Saving Potential in the EU27+

Countries with highest potential in Tertiary Sector

- France, Germany, UK, Italy, Spain



Source: Absolutely Offices, UK





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# Identification of issues

Issues regarding RE integration...



- discussed in media and public
- encountered by market participants
- identified during political process to implement EU directives
- identified in projects like GreenNet, Dispower etc.



# GreenNet Approaches

To identify Barriers and Best Practice

- a. Expert Platforms
- b. Investors Point of View
- c. Stakeholder consultation
- d. Simulation of RES-E integration





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# Expert Platforms

Expert Platforms implemented in

1. Norway
2. Greece
3. Poland
4. Romania
5. Germany



# Expert Platforms

## Investors Point of View

1. Norway (Wind power integration, grid code issues)
2. Greece (Highly fluctuating wind resource)
3. Poland (Regional wind power congestion)
4. Romania (Connection costs, lack of transparency and DSO cooperation)
5. Germany (Connection costs, balance regional power centres on international scale)







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# Investors Point of View

Risks and barriers:

- Grid connection costs
- Connection asset ownership
- Selection of Grid connection point
- Project development delays
- Changing, unforeseeable regulation



# Investors Point of View

Further risks and barriers:



- Changing interest rates
- Foreign currency exchange rates
- Inappropriate or non-adapting support mechanisms
- Discrimination in access to co-funding

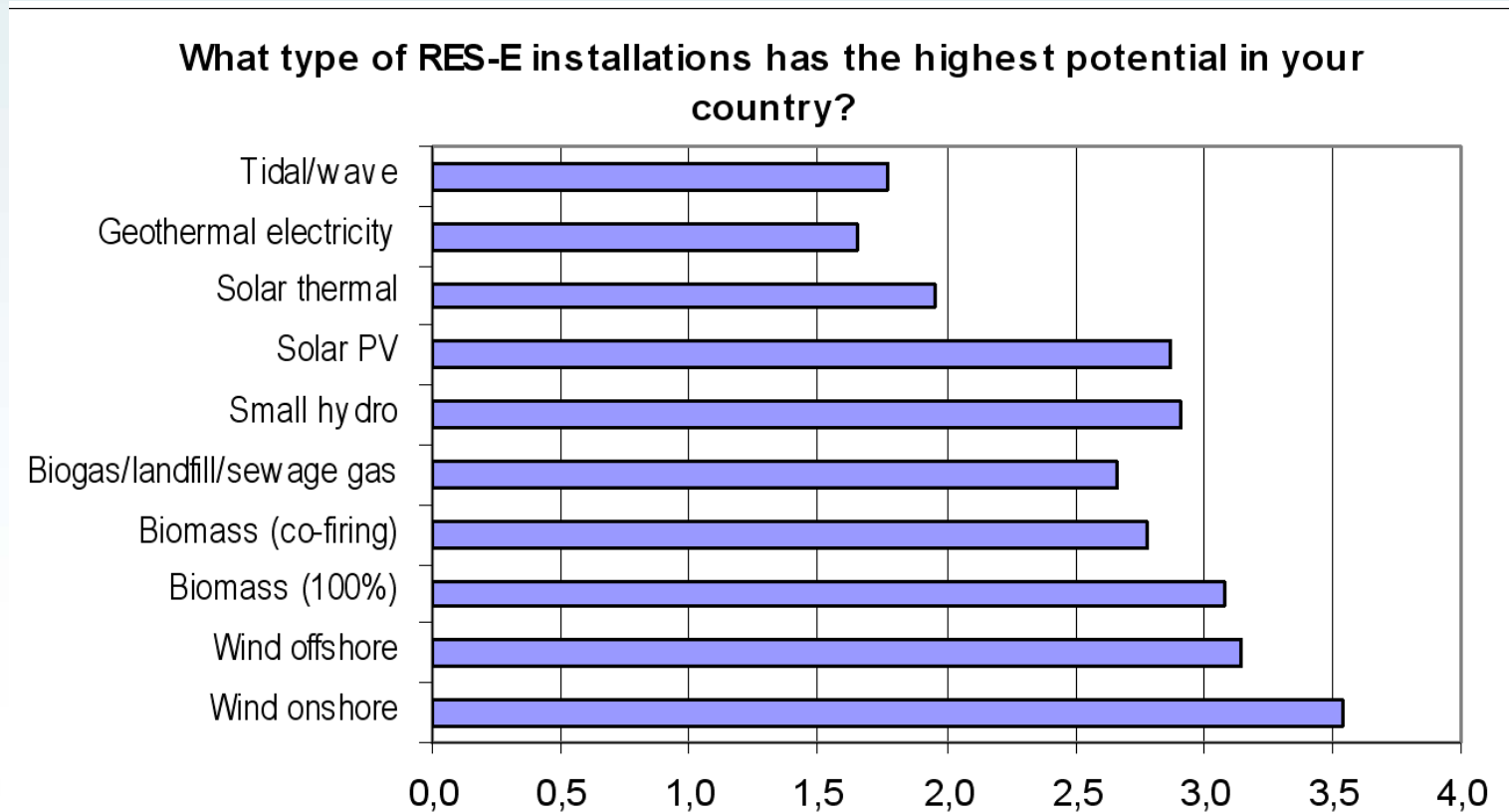


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# Stakeholder consultation

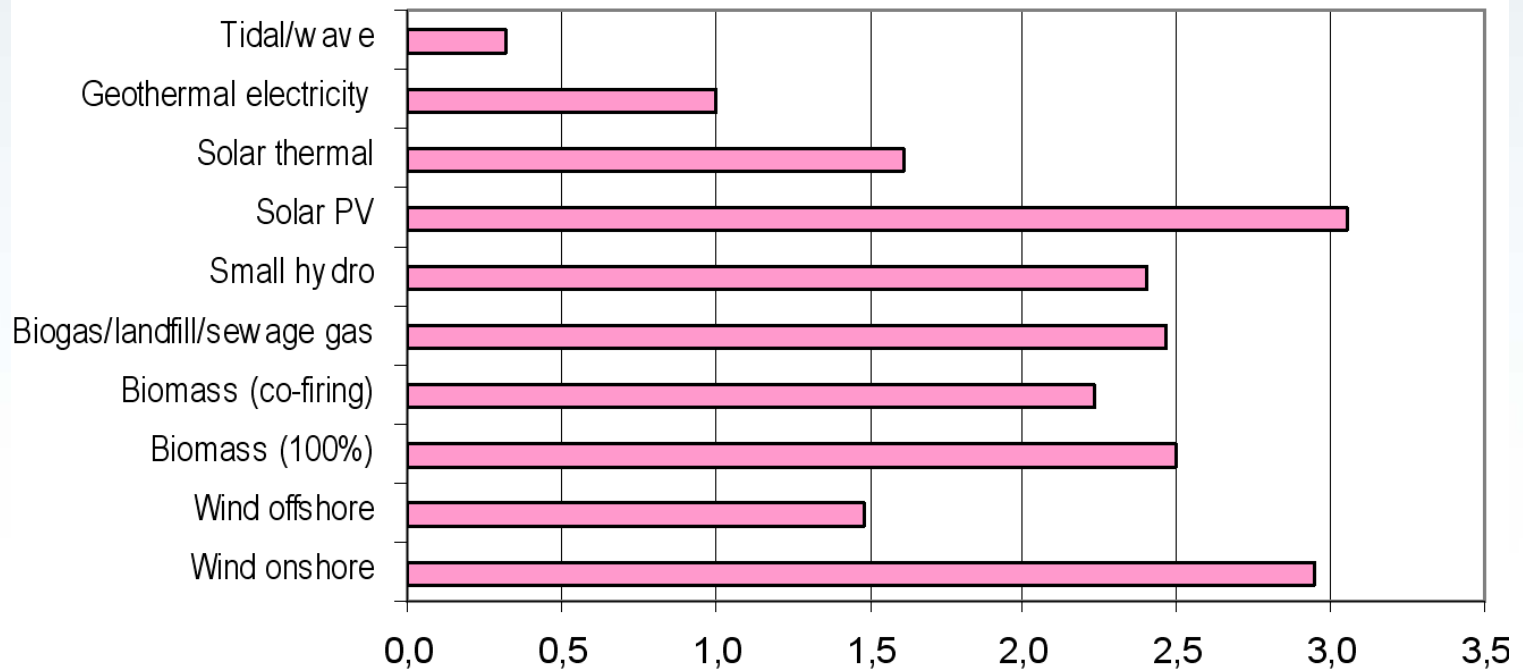
Resource:



# Stakeholder consultation

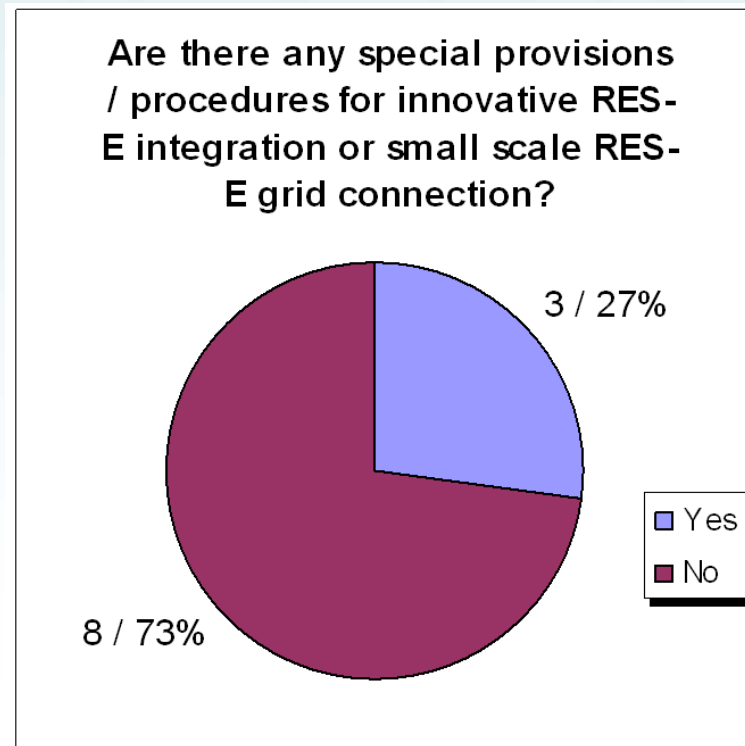
Resource:

What type of RES-E installations currently develops in the most dynamic way?



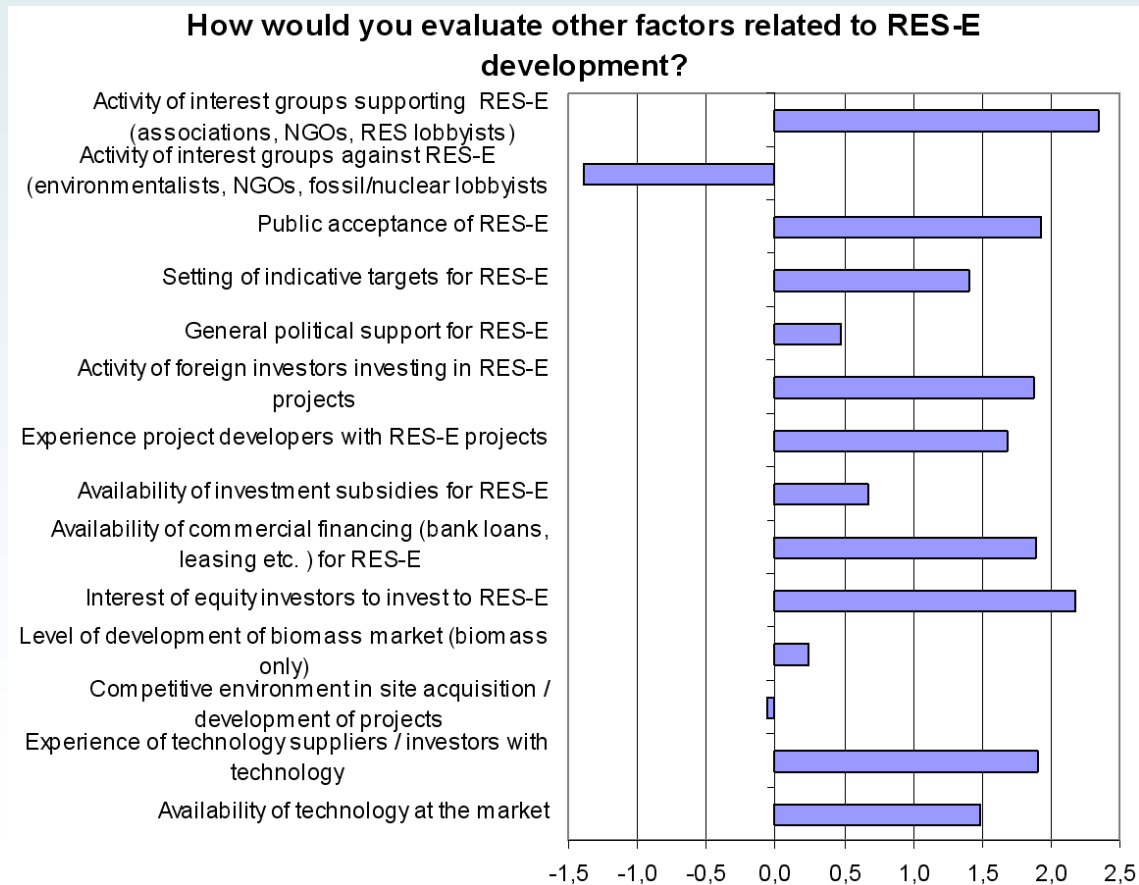
# Stakeholder consultation

## Technology:



# Stakeholder consultation

Policy:

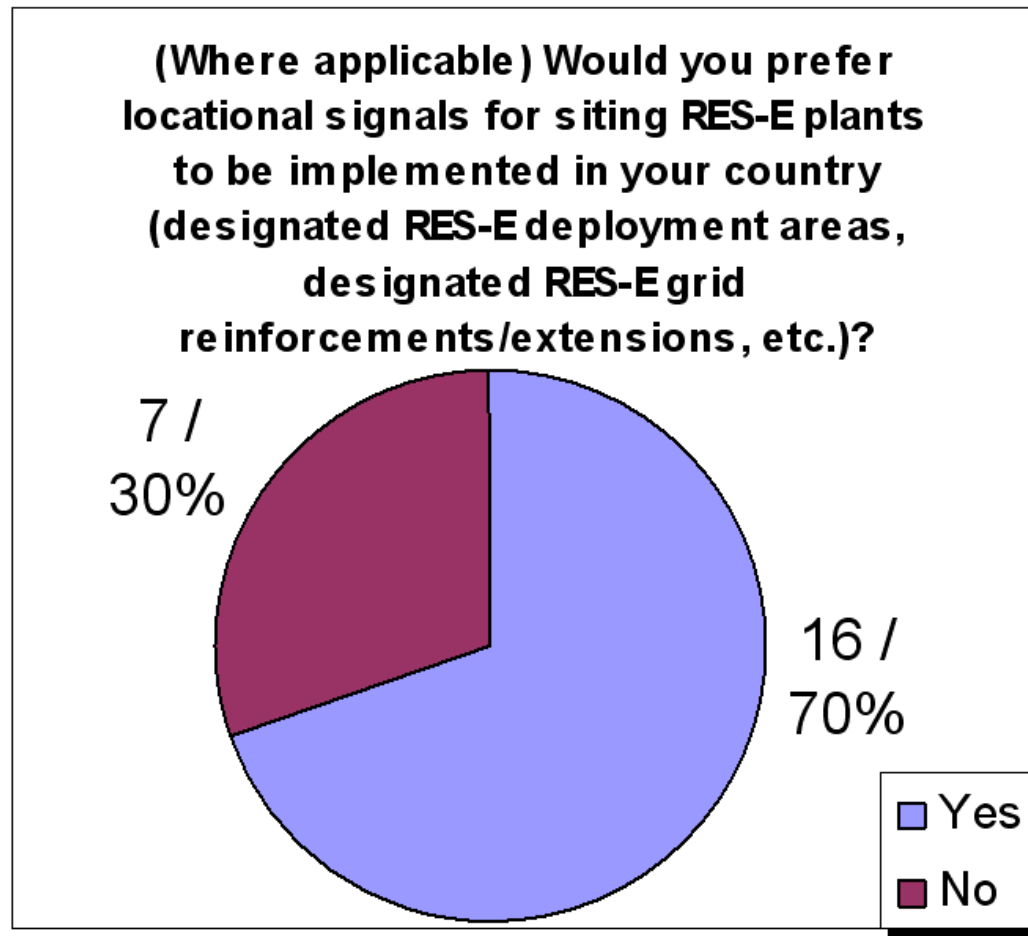


-5 negative, 0 neutral, 5 positive



# Stakeholder consultation

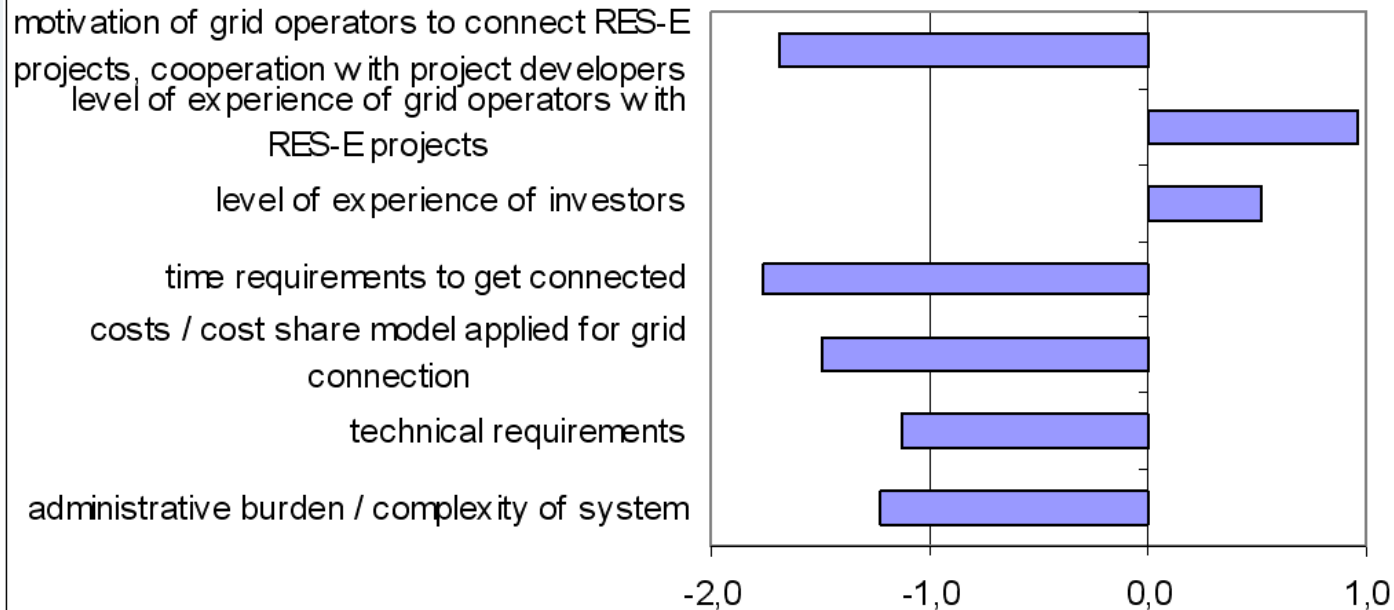
Policy:



# Stakeholder consultation

## Policy:

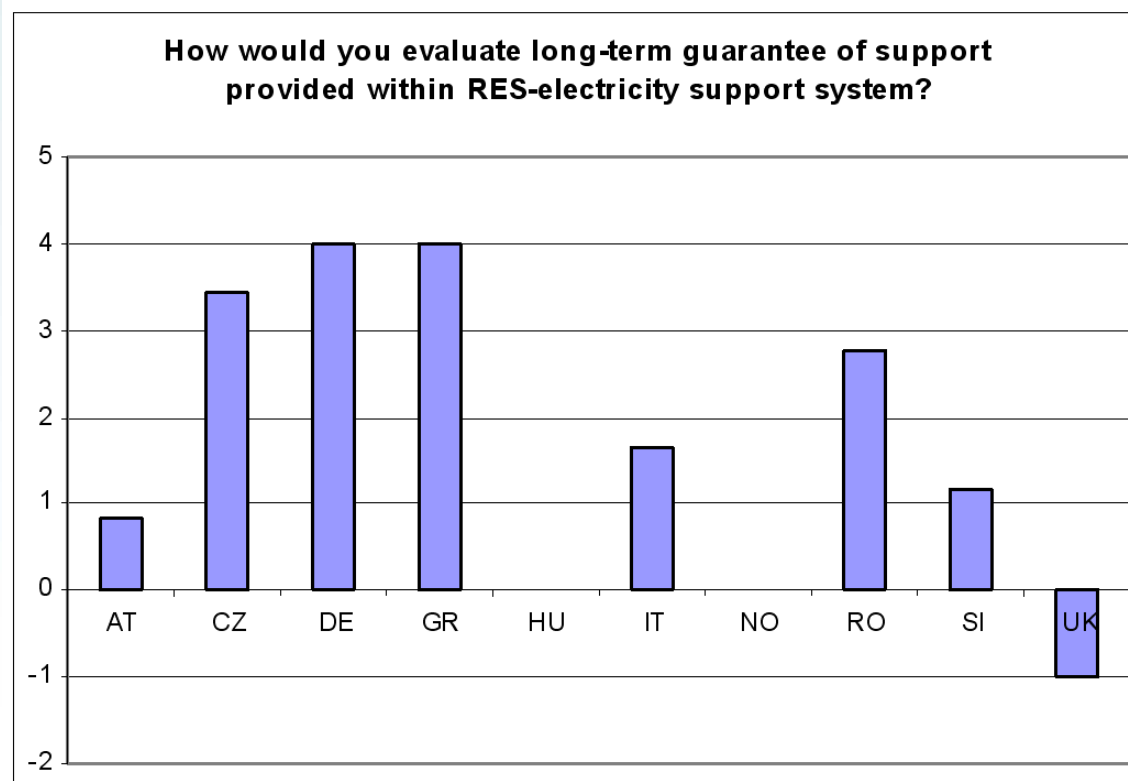
How would you evaluate the following factors related to Grid connection procedure?



-5 negative, 0 neutral, 5 positive

# Stakeholder consultation

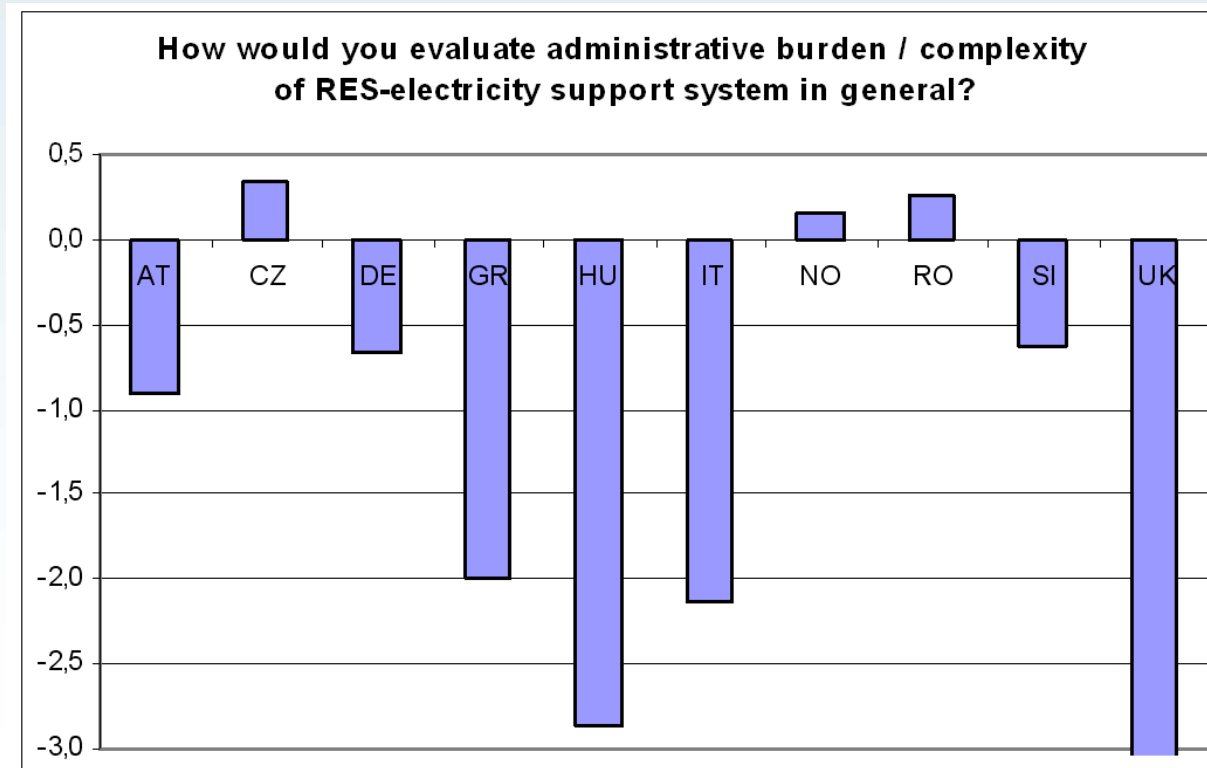
## Policy:



-5 negative, 0 neutral, 5 positive

# Stakeholder consultation

Policy:



-5 negative, 0 neutral, 5 positive



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# Results from simulations for optimised RES-E integration

## Selected results for EU-27 region

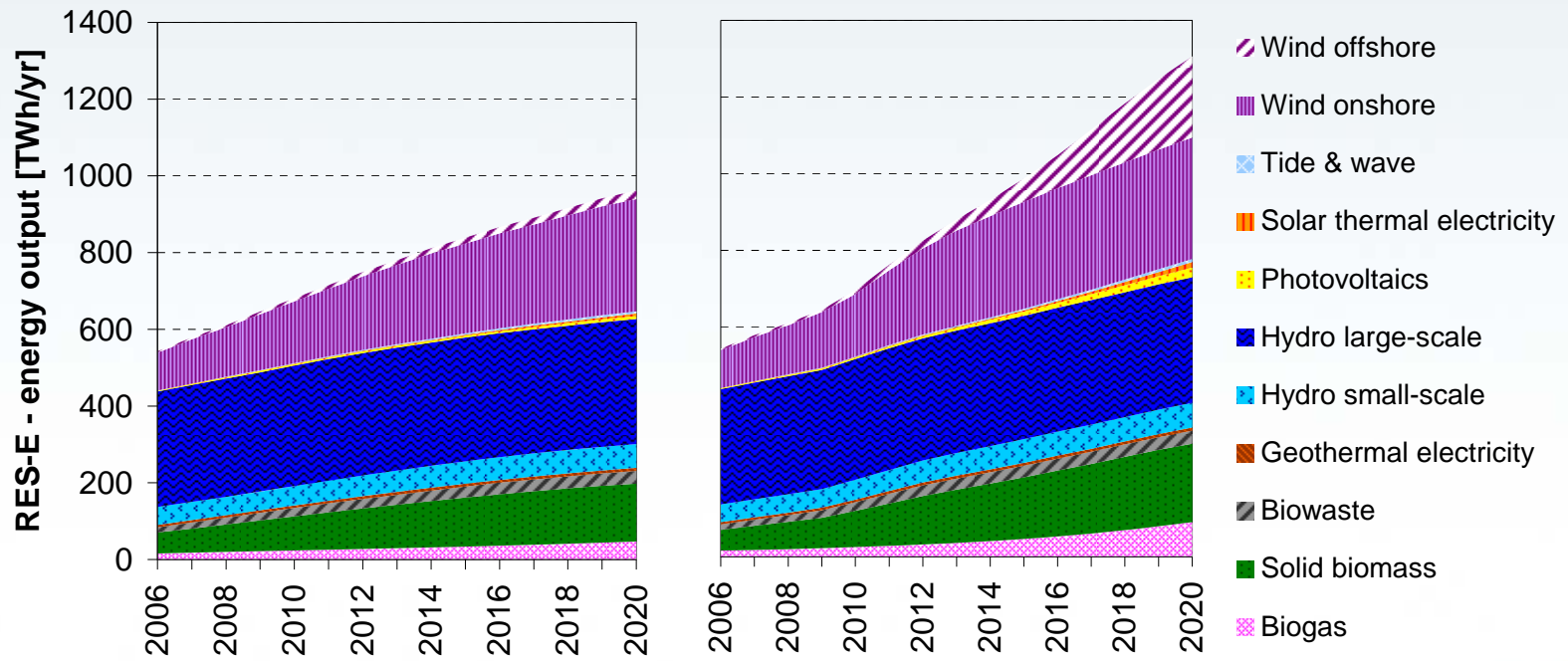


- RES-E deployment
- Integration cost of wind power
- Sensitivity on cost allocation policy
- Sensitivity on improved energy efficiency
- Investigated scenarios:
  - Business As Usual support (BAU) - current support policies retained until 2020
  - Strengthened National Policies (SNP) – in line with 20% RE target on EU-level



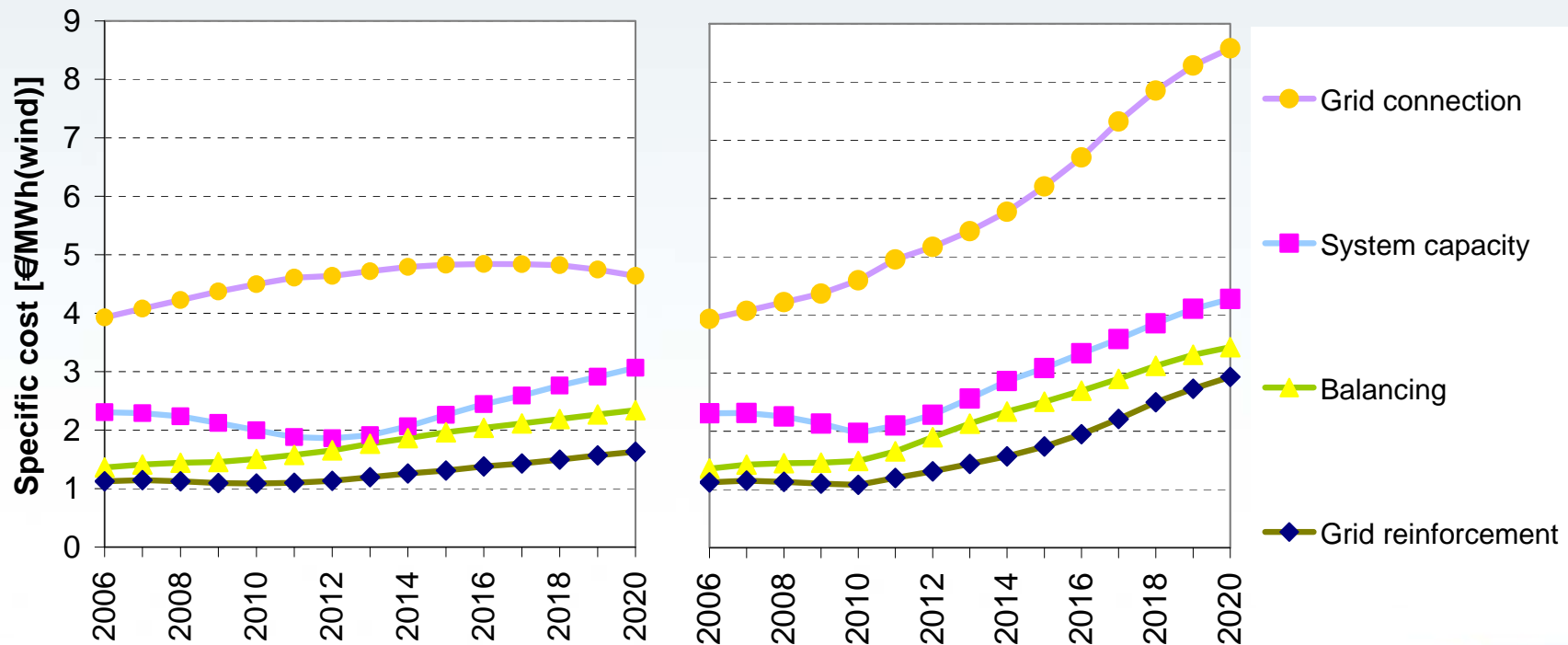
# Results from simulations for optimised RES-E integration

RES-E deployment until 2020 for BAU support (left) and SNP (right)



# Results from simulations for optimised RES-E integration

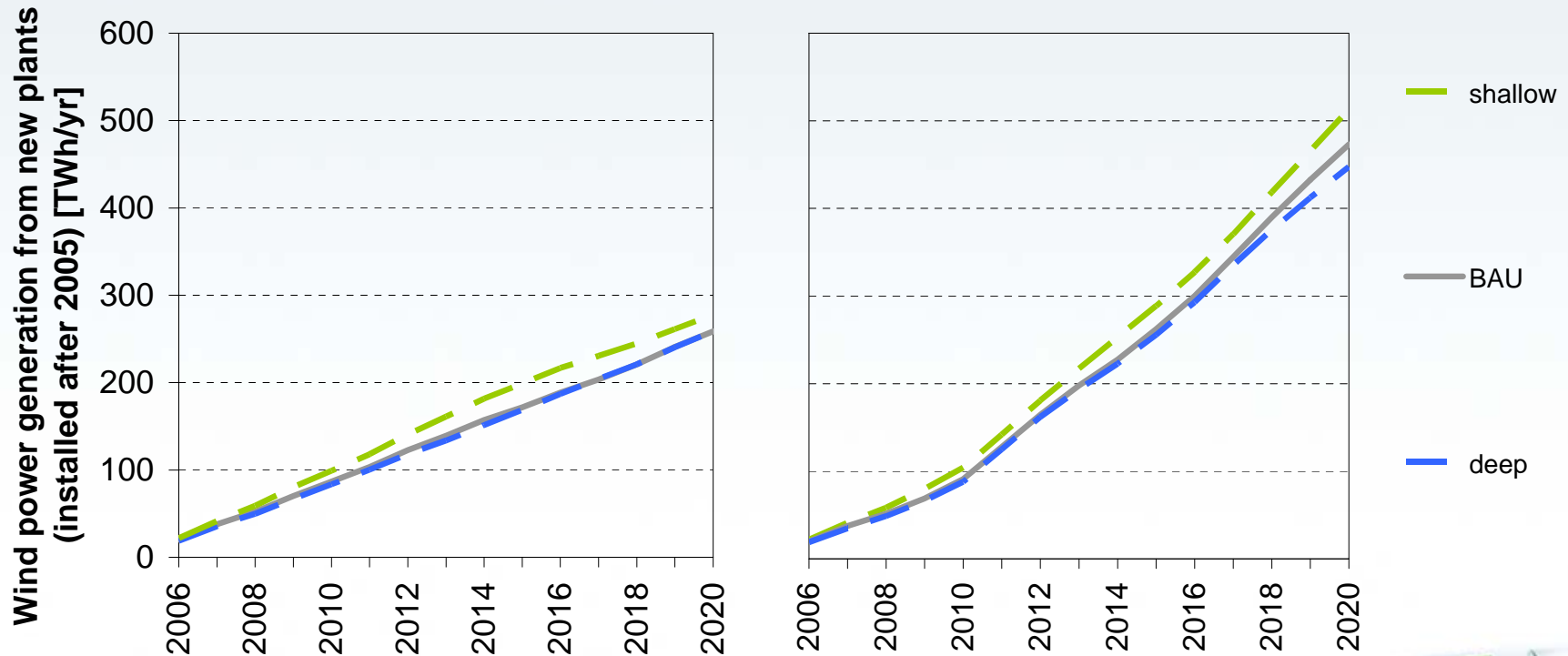
Specific grid integration cost for BAU support (left) and SNP (right)





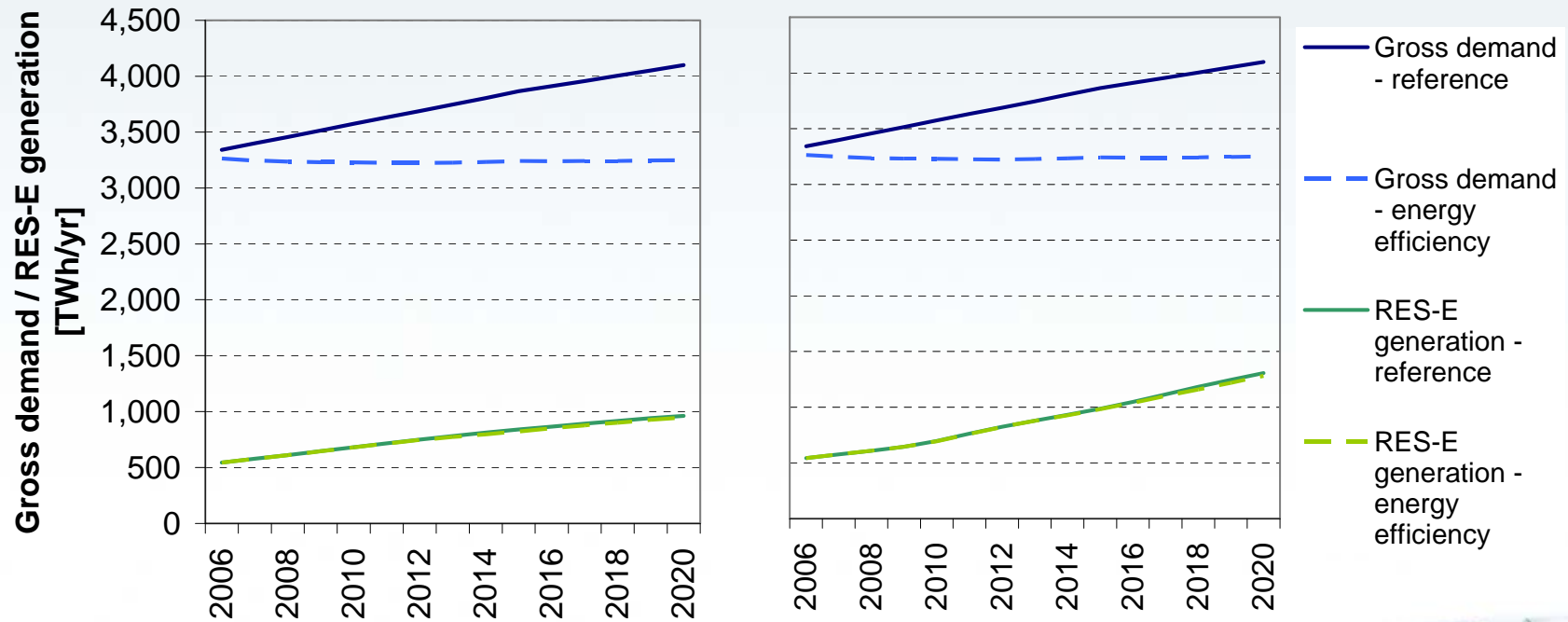
# Results from simulations for optimised RES-E integration

Effect of cost allocation policy on wind power deployment for BAU (left) and SNP (right)



# Results from simulations for optimised RES-E integration

Interaction between improved end use energy efficiency and RES-E deployment for BAU support (left) and SNP (right)





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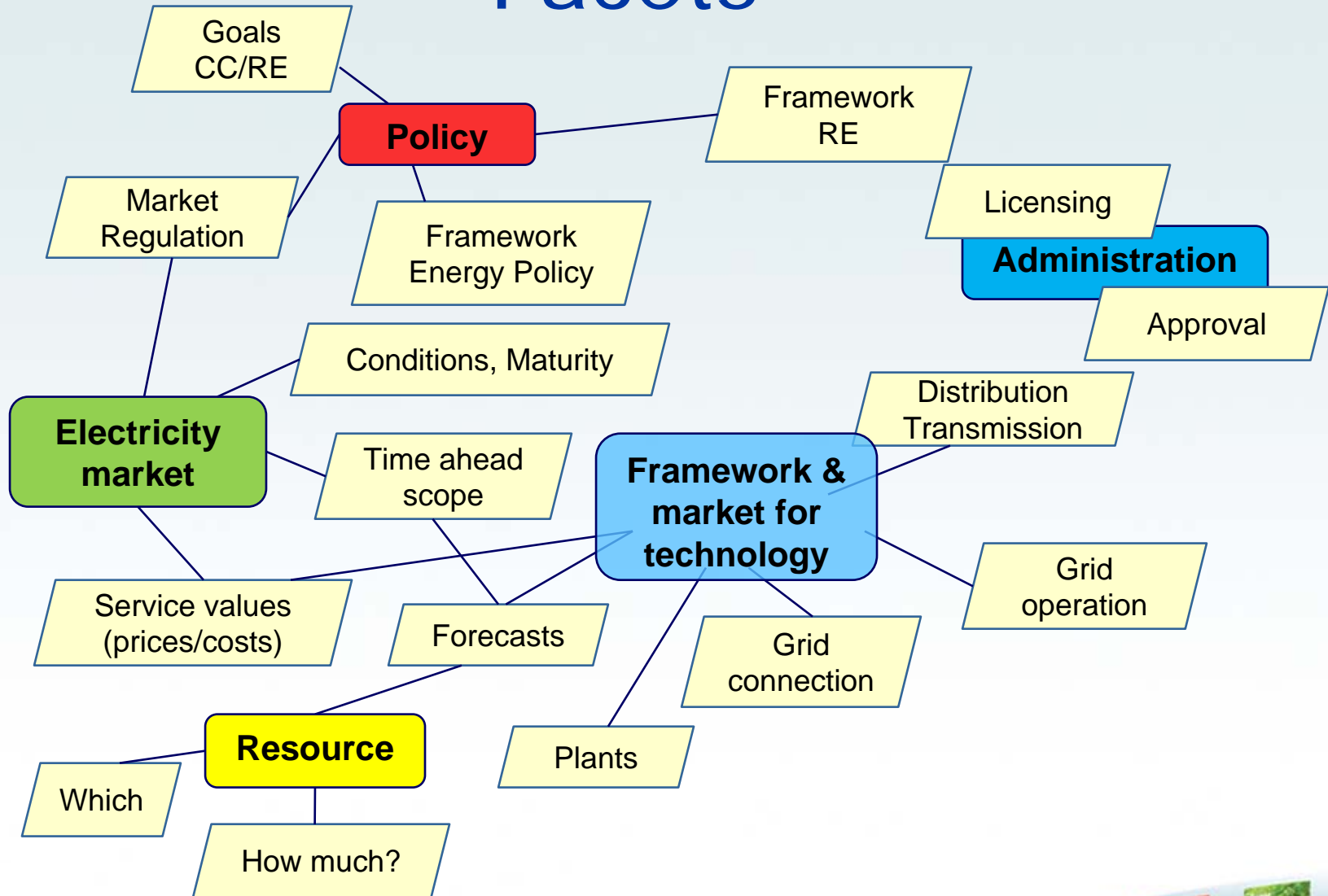


# A classic: Incentive system

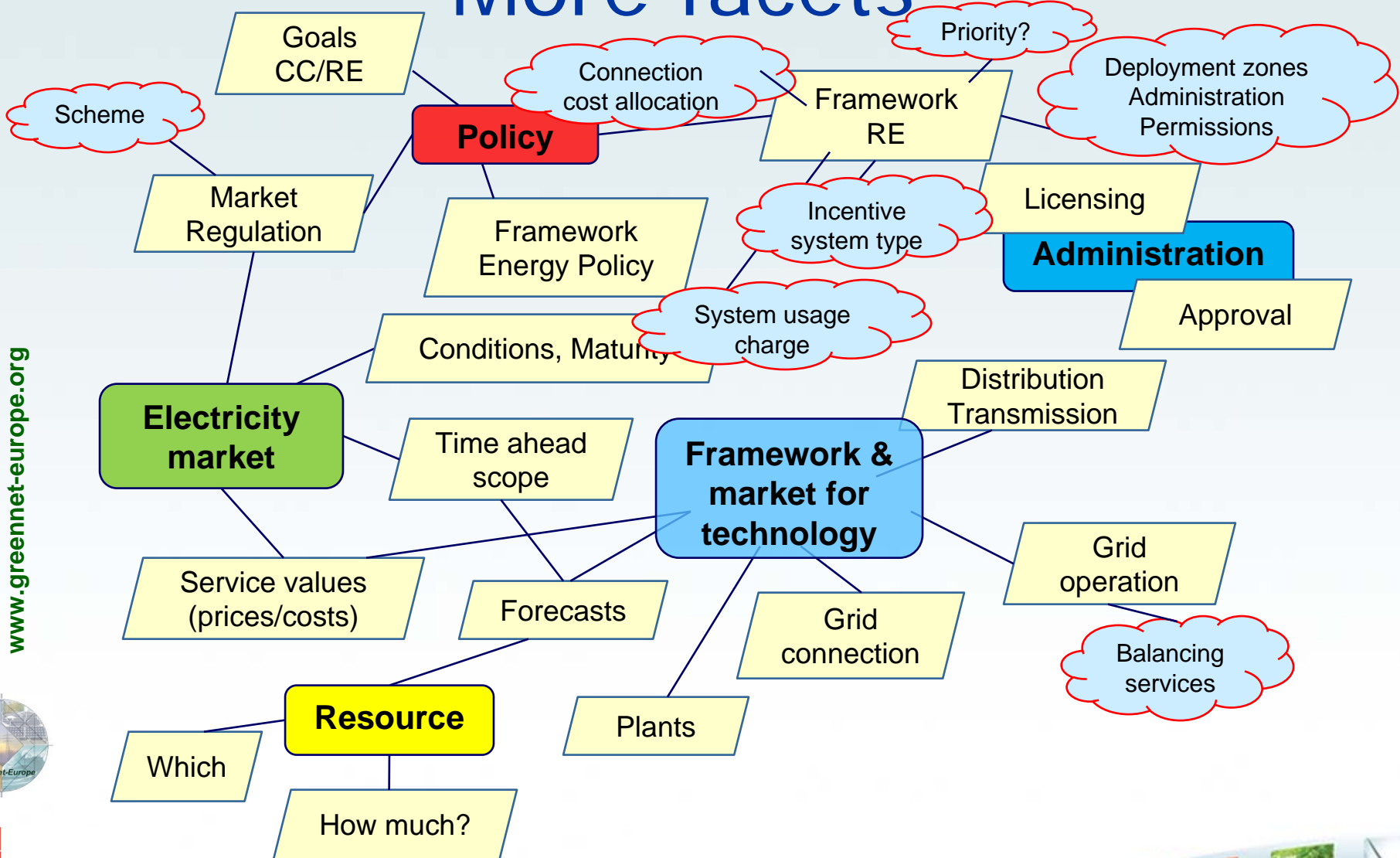
- Incentive system type
  - Feed in Tariff (FIT)
  - Renewable Energy Tariff (RET)
  - Renewable quota system
  - Carbon credit trading



# Facets



# More facets





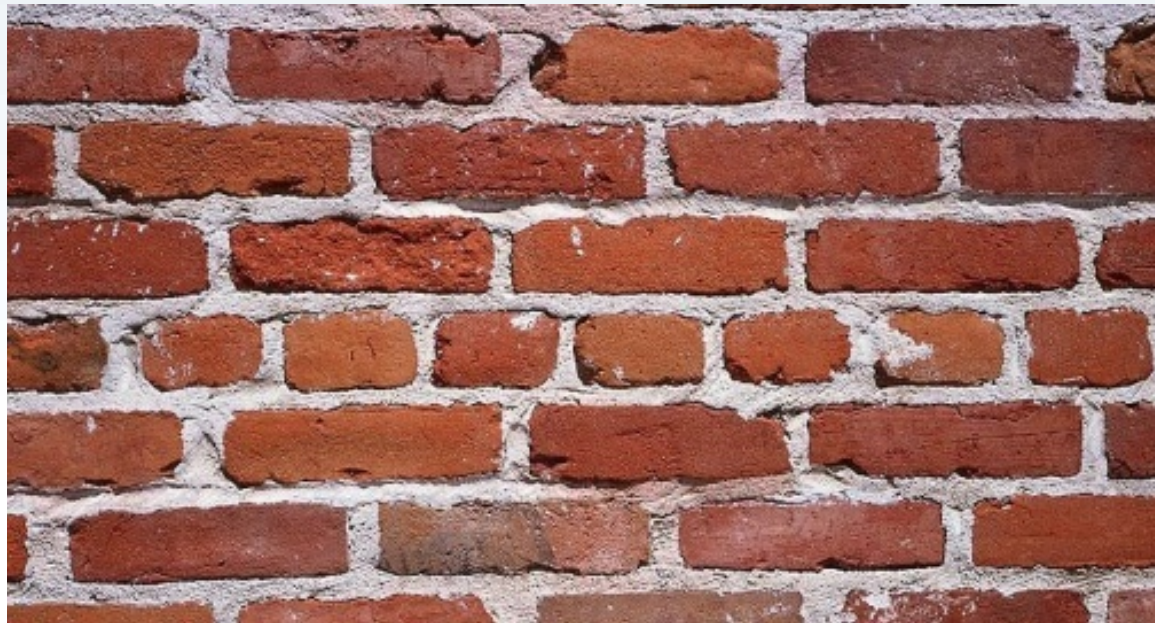
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# Barriers

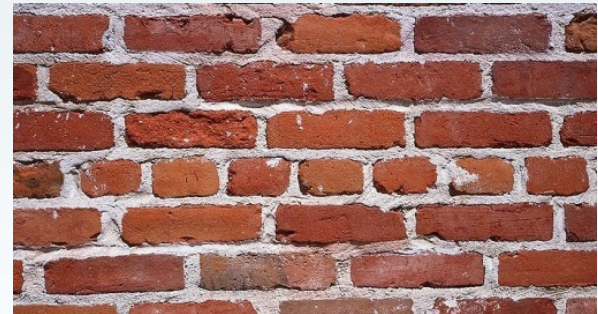
- Successful deployment of renewable energy technology **REQUIRES** measures to overcome non-technological barriers





# Non-technological barriers

- Social
- Industrial (market development)
- Economic barriers
- Administrative
- Regulatory
- Political
- Availability of resource



# Interest Groups

## Pro

- Investors
- RE associations
- Environmental groups
- Consumer peer groups
- Dedicated utilities

## Against

- Landscape protection organisations and environmental groups
- Locally affected people
- Consumer associations
- Utilities

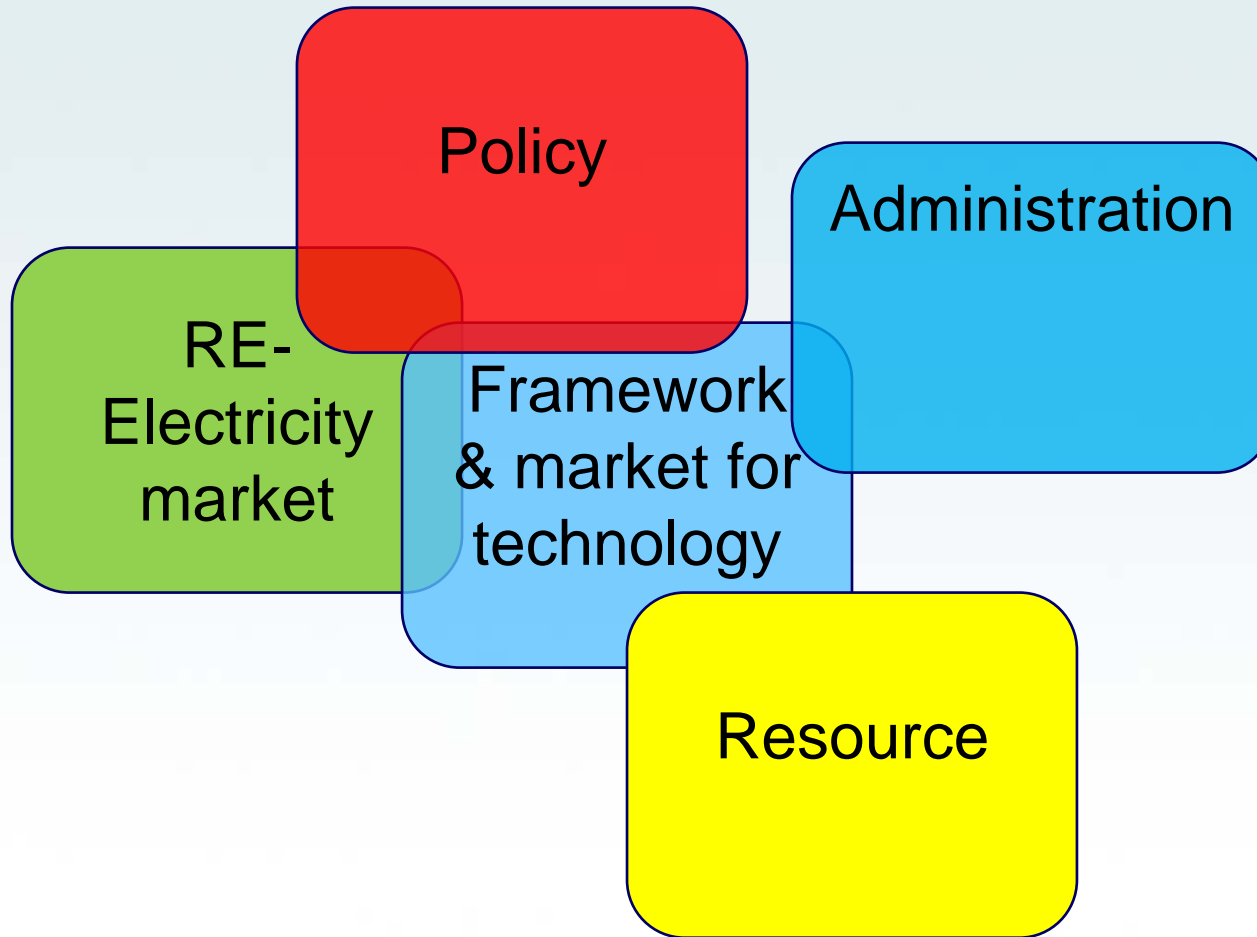




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# Example of barriers



# Policy

- No clear political targets defined
- Quickly changing policy
- Lack of acceptance in public
- Lack of energy awareness & education



# Policy - Incentives

- Incentive too low
- Incentive regulations include barriers
  - Example: Greece, Hungary, Italy high administrative burden



# Administrative burdens

- Construction permits
- Land use planning
- Environmental impact assessment
- Lack of co-ordination between administrative authorities



# Promoters as a barrier?!

- Blocking by competitive developers
- Lack of experience of project developers
- Investors expecting excessive returns





# Regulation of connection

- Costs incur for utility
- High grid connection costs for project developer
- Lack of informational exchange between parties/people involved
- Long process for approval
- Old grid structures
- Lack of experience



# Electricity Market

- Not appropriate for RE
- Need for large quantities





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# Good practice in RES-E integration

Rarely exactly identifiable

- Many influence factors
- National situations differ widely



However: Success is strong indicator and  
Satisfaction of participants

also: Adjustments have shown  
positive effects

# 1. RE Policy Framework

- Continuity of policy
- Set long-term targets (investment security)
- Ensure compatibility with other regulation and legislation
- Inform public and promote RE



# 1. RE Incentive Policy

- Prioritise renewables
- Distinguish existing and added capacity
- Address potential with least-costs first
- Incentives high enough and adjusted regularly, but foreseeable!



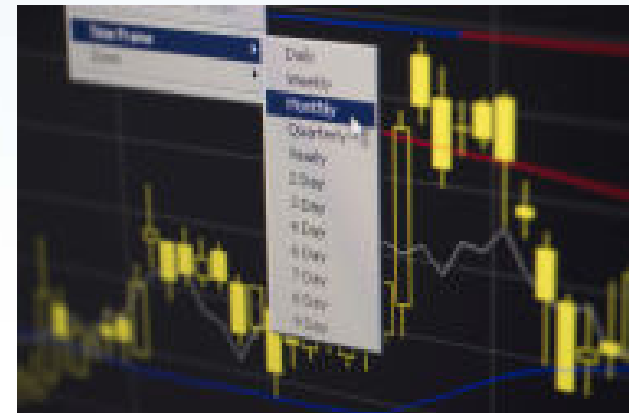
# 2. RE Policy Implementation and Administration

- Streamline administration
  - allocate resources
  - approval, licensing process
  - offer single-stop service
- Set implementation deadlines for granted projects
- Identify and mitigate barriers and bottlenecks



# 3. Regulation of Electricity Market

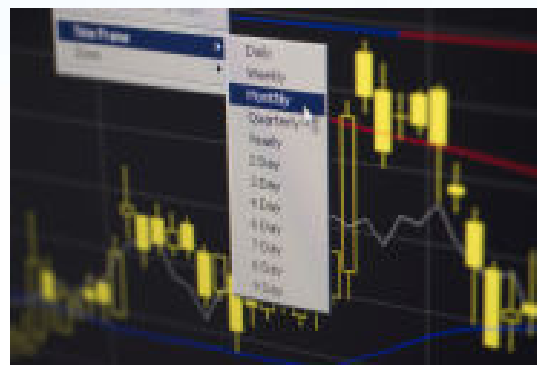
- Enable DSO/TSO to socialise costs
- Avoid complex formulas in regulation
- Shallow connection cost models
- Unbundle services/assets
- Guard electricity costs
- Green certificate schemes





# 3. Electricity Market

- Integrate RES-E producers in market
- Create short-time ahead market
- Geographic expansion of market
- Limit costs absorbed/caused by trading
- Implement market mechanisms in grid balancing
- Keep market real



# 4. Framework for Technology

- Instigate reinforcement of EU-transmission grids
- Coordinate grid planning procedures
- Clear definition of boundary of assets and ownership
- Specify roles for tendering etc. if no consent achieved



# 4. Framework for Technology

- Propagate EU-harmonisation of grid codes and standards
- Give early notice about planned regulatory changes



# 4. State-of-the-art Technology

- Develop new grid management models
- Foster enhanced forecasting methods
- Harness advantages of DG
- Require additional energy services from large RES-E producers
- Enable responsive electricity demand and further storage technology R&D



# 5. Resource potential

- Identify energy efficiency potential
- Identify unused resource
- Consider repowering
- Define priority deployment zones
- Seek trade-off between RE and other interests



Source: BSW, Germany



Source: BSW, Germany



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Source for most photos included:  
Matton Images

