EREF SMALL HYDROPOWER CHAPTER
EUROPEAN RENEWABLE ENERGIES FEDERATION



Small hydropower in the new European electricity market

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Athens

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EREF

- Federation of national renewable energy associations from EU Member States, representing all sectors
- Characteristics:
  - Promotes a holistic view on energy policy and energy system transformation
  - Speaks out against continuous support for conventional energy
  - Regarded by EC and EP as highly credible, competent and most ambitious advocate
  - Represents SME's interest
  - Assists in access to legal advice (including law suits)

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EREF SHP Chapter

- Small hydropower associations from AT, BE, CZ, DE, EE, EL, ES, FR, IE, IT, PL, PT, SE, SK
- Policy activities:
  - CIS process (Common Implementation Strategy for the WFD) of the DG Environment of the European Commission
  - Better Regulation Campaign that aims at reducing contradictions in EU legislation
  - EU Energy Union
  - EU's long-term climate strategy
  - State Aid Guidelines

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The EU small hydropower sector

- More than 35,000 direct jobs
- Around 4,200 enterprises
- Ca. € 3 billion of annual turn-over
- Produced electricity for more than 13 millions households
- Corresponds to around 8% of electricity produced by renewables
- Avoidance of ca. 29 millions tons of CO_2
- Development potential

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The EU regulatory framework for SHP

- Water Framework Directive
- Renewables Directive and EU Energy Union
- Contradicting and uncoordinated policies within European Commission
- Differences in national implementation of EU goals and principles
- Different law and administration systems throughout and within EU Member States

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Key topics of Water Framework Directive for SHP

- Permits for new power plants
- No-go areas vs. site specific approach
- Investments for environmental impact assessment and mitigation measures
- Residual flow obligations

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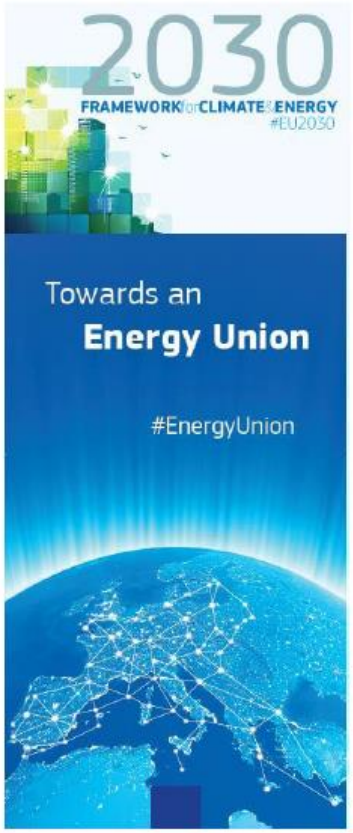
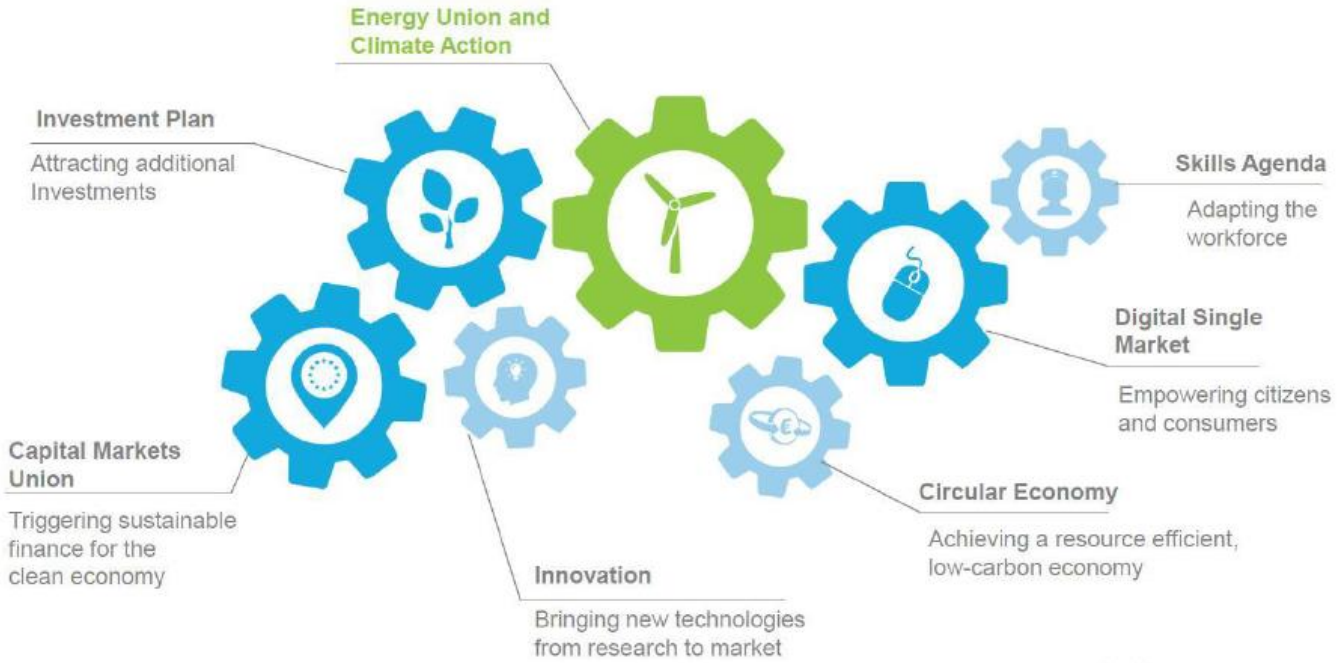
Policy context: EU Energy Union and climate action





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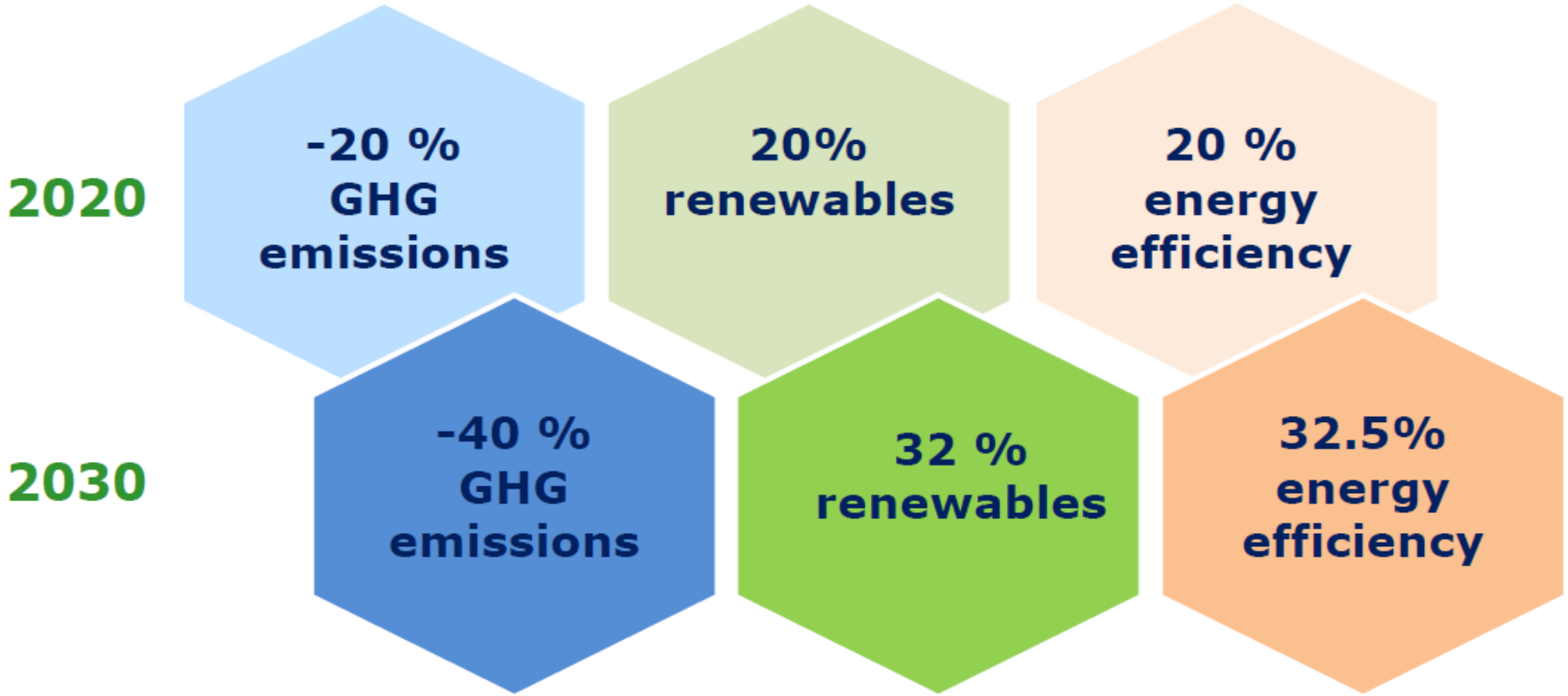
European climate and energy targets



The Clean Energy Package

Innovative

Inter-connected

Enabling Framework

Energy Union Governance

Inclusive

Energy Efficiency

Energy Efficiency Directive, Energy Performance of Buildings Directive

Renewables

Revised Renewable Energy Directive

Electricity Market Design

Regulation and Directive on internal electricity market; Regulation on risk-preparedness, ACER regulation

Socially fair

Safe for all

Digital

Investment-friendly

European Commission

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The EU Energy Union: transformation of Europe's energy system

- Renewable energy (all technologies) and energy efficiency as centre piece for a new stable, secure, affordable and democratic EU energy system
- EU-wide but decentralised energy system with multitude of independent power producers, paired with large scale RES provider
- Demand-side management
- Storage
- Sector coupling
- Interconnectivity between national grids
- Regional cooperation (e.g. off-shore and cross-border)

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Benefits of hydropower for the new energy system

- Hydropower offers whole range of system services
- Hydropower is THE flexible tool in the system without CO_2 emissions in operation
  - Back-up and reserve capacity
  - Quick-start and „Black-start" capability
  - Regulation and frequency response
  - Voltage support
  - Spinning reserve
- Energy storage
- Hydro Pump Storage is currently the most cost-efficient form of energy storage and cost-efficient way of providing flexibility

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2018 study: Grid Contribution of SHP in Germany

- Bergische Universität Wuppertal, July 2018
- Main findings: German SHP plants
  - will become increasingly important in the future as more economical and more reliable power sources over lifetime
  - Reduce the need for grid expansion at the distribution grid level – particularly in rural medium-voltage and low-voltage grids
  - Reduce grid losses
- Without these SHP plants, additional costs of approximately € 1 billion for grid stability would incur

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Small hydropower as provider of system services

- Will become more and more a provider of whole range of system services

- Enables cost-effective integration of variable renewables

- Contributes to security of supply and stable grid operations

- Plays important tool in water management, flood protection and prevention of water scarcity

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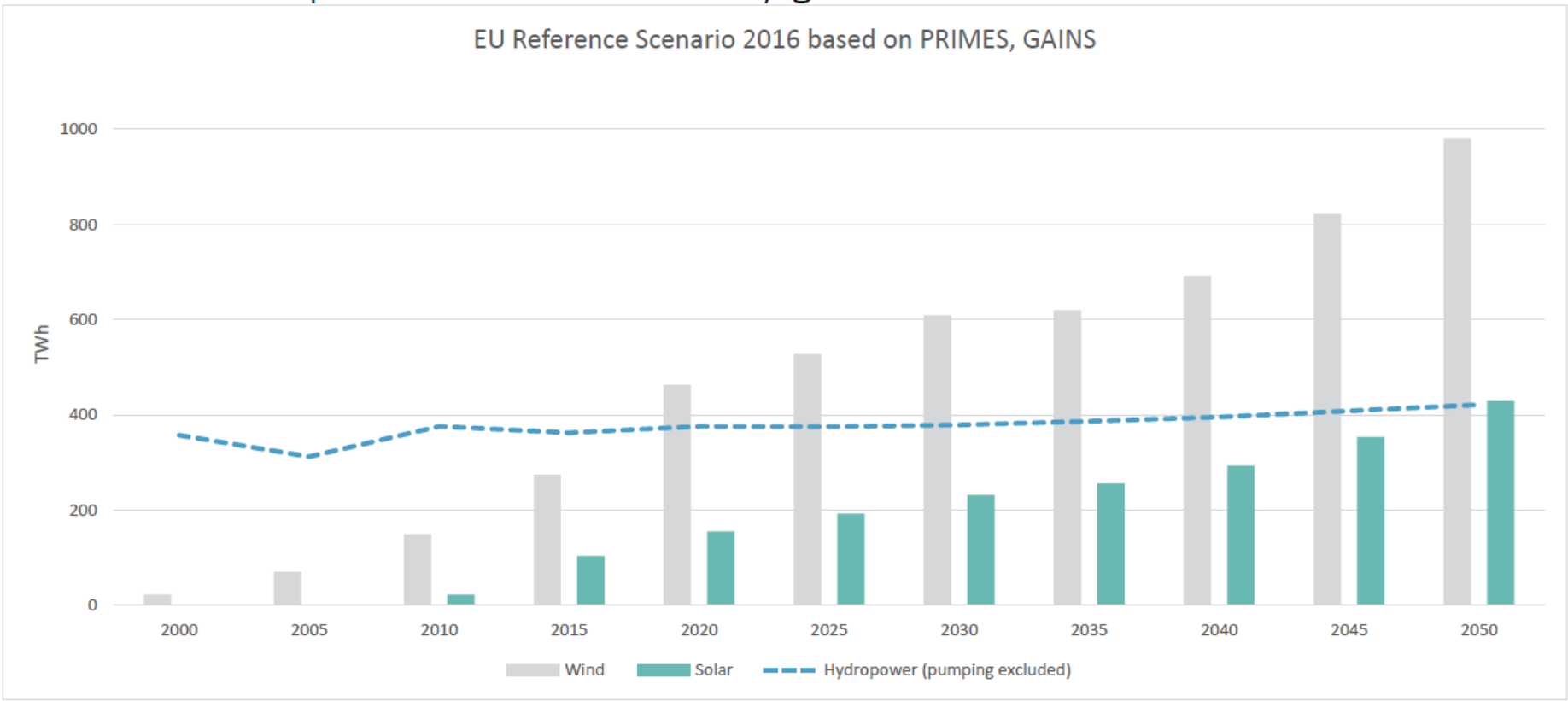
Hydropower in Europe today and in the future

Accelerated development of variable renewables (wind, PV): historical and predicted net electricity generation in the EU-28



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Hydropower development needs stable framework conditions

- Hydropower is a long term investment
- Multipurpose function of hydropower must be recognized and compensated (macro economic investment)
- However: current framework conditions at EU and national levels hardly provide incentives and business cases to invest in new plants
- Existing plants:
  - Necessity for efficiency measures
  - Upgrading and refurbishment of existing plants with new technology and environmental mitigation measures

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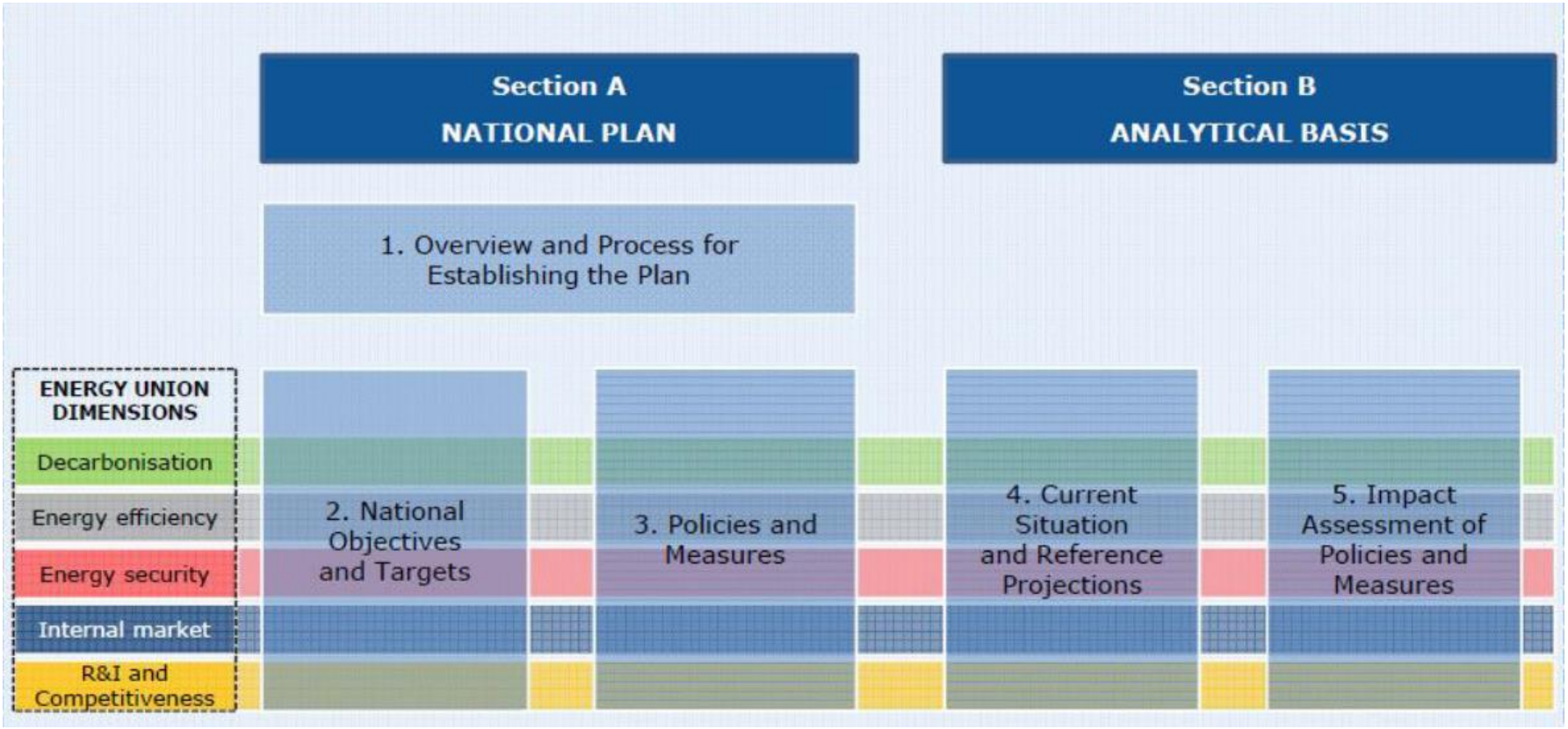
Get SHP higher on the agenda: Development of National Climate and Energy Plans



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Thank you for your attention!

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