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Regional Energy Security and Market Development
Overview of Task 1:
Regional Strategic Energy Planning

Performed by International Resources Group

October 2009 to December 2012

Objectives

USAID Objectives in the Region

- Economic Growth -- Improving service to customers: reliability, affordability, transparency
- Energy Security: Reducing vulnerabilities and potential for disruptions; diversify energy supplies; reduce energy import dependence
- Global Climate Change: Examine GHG mitigation options

Project Objectives

- Enhance national capacity to perform integrated energy system planning
- Examine the benefits and costs of Energy Efficiency and Renewable Energy policies
- Provide analytical inputs to inform policy formulation

Regional Energy Security and Market Development Task 1: Strategic Planning (RESMD-SP)

This initiative built on the earlier groundbreaking USAID Regional Energy Demand Planning (REDP) project that laid the foundation for integrated supply/demand energy systems analysis in Southeast Europe through 2030.

National energy system planning models and capacity were built in nine (9) Contracting Parties and Observer Countries of the Energy Community.

They represent a compilation of the current energy picture in participating countries, and presents likely energy system pathways and associated investment requirements under reasonable assumptions regarding world energy prices, economic growth, and technology development.

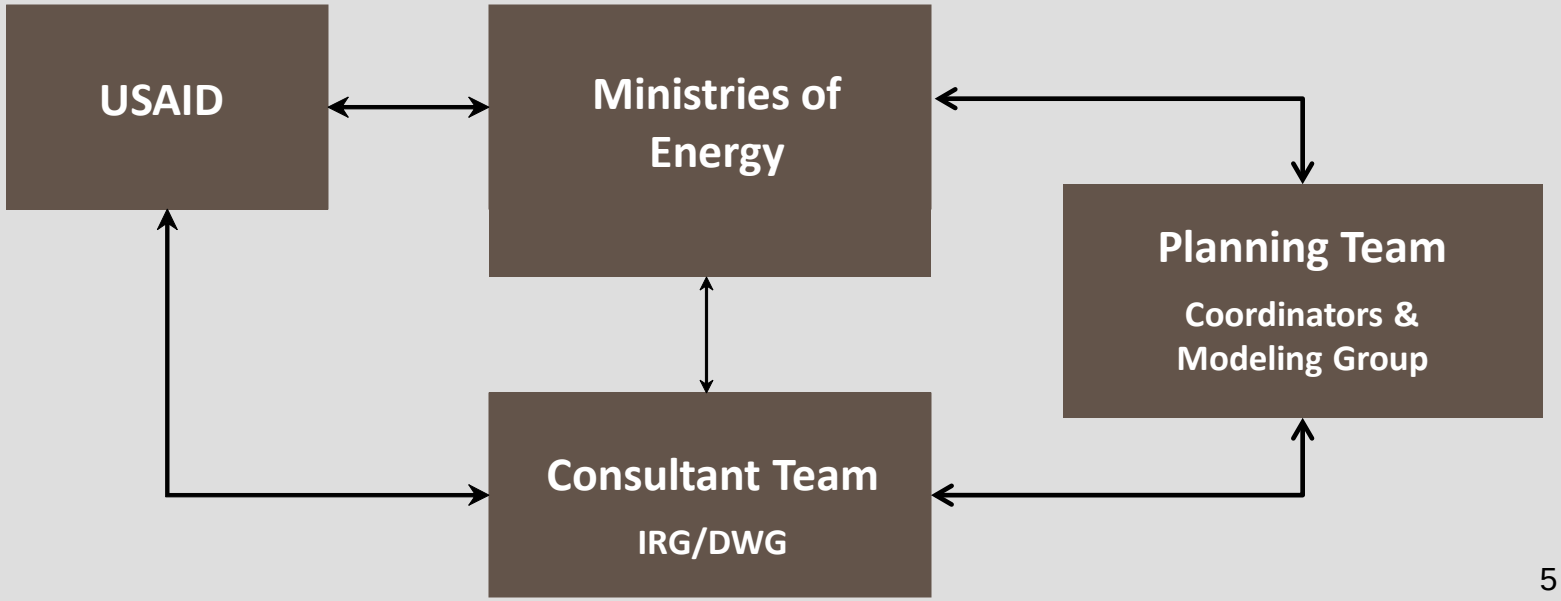
It examines the potential for Energy Efficiency and Renewable Energy policy to influence the evolution of the participate country's energy systems in terms of energy security, competiveness and climate change.

Project Overview

- **Purpose:** Establish and build capacity within National Planning Team consisting of representatives from Ministries and energy sector institutions to support strategic energy planning and inform the policy formulation process by establishing/advancing national Planning Teams.
- **Implementation:** Assist countries in developing integrated energy system models using MARKAL/TIMES, review data and assumptions, and perform policy-oriented analyses.
- **Coordination:** USAID/IRG, with assistance from Hellenic Aid/CRES 2010-2011 under the SYNENERGY collaboration, in cooperation with the Ministries and Energy Community Secretariat.
- **Anticipated Outcome:** An analysis performed by the National Planning Teams of energy efficiency and renewables opportunities, as well as other key national priorities, and to institutionalize the energy planning process.

Energy Community Strategic Planning Initiative Partners

- **Contracting Parties**: Albania, BiH, Croatia, Macedonia, Armenia, Serbia, and Ukraine
- **Observer Countries**: Armenia and Georgia
- **EU Countries** (voluntary participants): Bulgaria, Romania



RESMD-SP Participating Countries Planning Teams

Country	Lead Ministries	Planning Team Institutions
Albania	Ministry of Economy, Trade and Energy	Albanian Agency of Natural Resources
Armenia	Ministry of Energy and Natural Resources	Energy Strategy Centre of the Scientific Research Institute of Energy
Bosnia and Herzegovina	Ministry of Foreign Trade and Economic Relations	Faculty of Electrical Engineering in Istocno Faculty of Electrical Engineering in Sarajevo
Bulgaria	Ministry of Economy and Energy	Ministry of Economy and Energy
Croatia	Ministry of Economy, Labour and Entrepreneurship	Ministry of Economy, Labour and Entrepreneurship Hrvatska Elektroprivreda (HEP) Energy and Environmental Protection Institute Ltd (EKONERG)
Georgia	Ministry of Energy and Natural Resources	World Experience for Georgia Tbilisi State University
Macedonia	Ministry of Economy, Department of Energy	Ministry of Economy, Department of Energy Research Center for Energy, Informatics and Materials, Macedonian Academy of Sciences and Arts (ICEIM-MANU)
Moldova	Ministry of Economy and Commerce	Academy of Sciences of Moldova / Institute of Power Engineering
Romania	Ministry of Economy	Transelectrica
Serbia	Ministry of Mining and Energy	Electric Power Industry of Serbia (EPS)
Ukraine	Ministry of Energy and Coal Industry	National Academy of Science / Institute for Economic Forecasting

Project Activities

Task 1: Organization of the Planning Teams → Task 2: Data Collection & Preparation

Task 3: Calibration & Initial Model → Task 4: Add Transportation and Refining

Task 5: Data and Model Assumption Review by Stakeholders → Task 6: Development of the Reference Scenario

Task 7: Preliminary EE&RE plus National Analyses → Task 8: Dissemination of Results & Integration into Planning Process

2008-2011

2011-2012

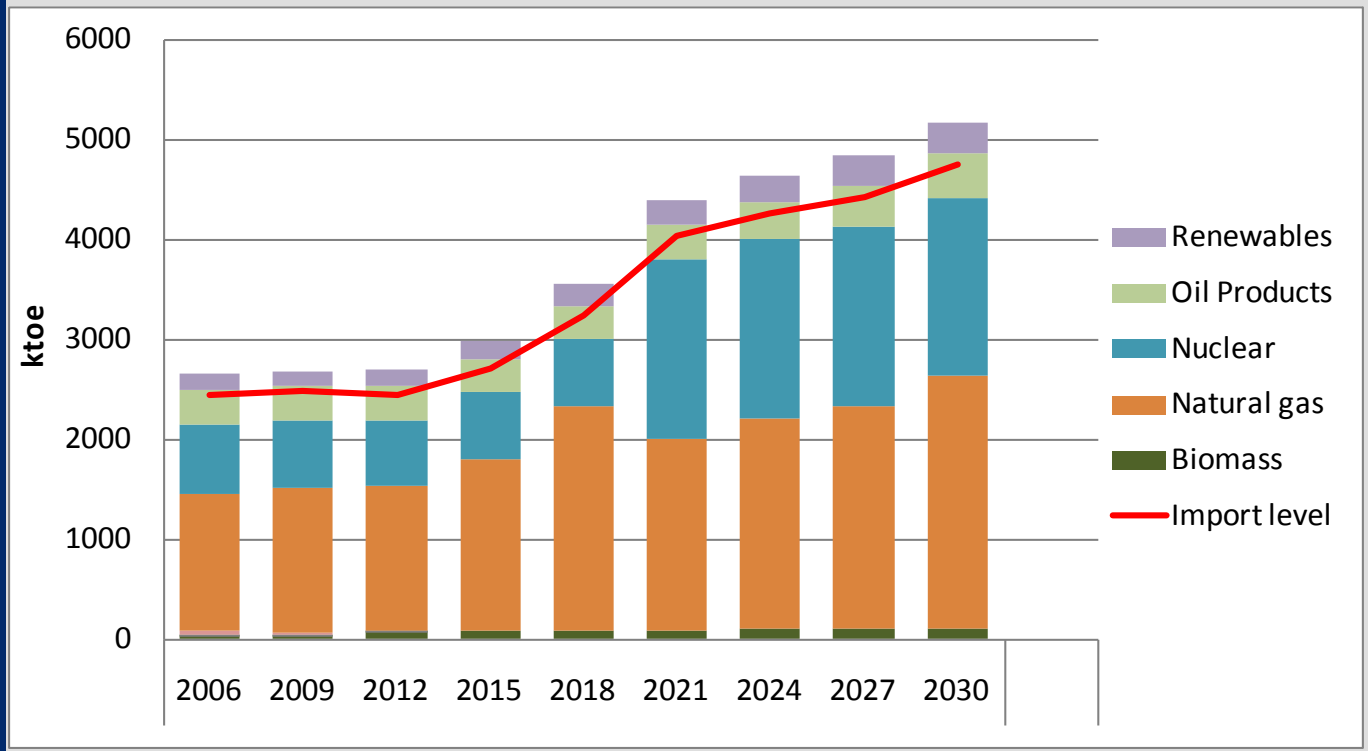
Accomplishments & Regional Model Plans

- RESMD-SP undertaking clearly makes a strong indicative case that energy efficiency and renewable energy investments are important and can contribute to helping EC countries improve their energy security, economic growth and CO_2 emissions situation.
- The national planning teams have to capacity to use their models to quantify benefit and costs of national priorities and EC requirements to advise the Government decision-making process.
- USAID is currently supporting the integration of the EC models into a single integration regional planning framework.
- This comprehensive framework can serve as a useful foundation for evaluating projects of regional significance and examining coordinated approaches to common concerns, including exploring LEDS options, throughout the EC.

Example of National Policy Planning and Analysis Capability

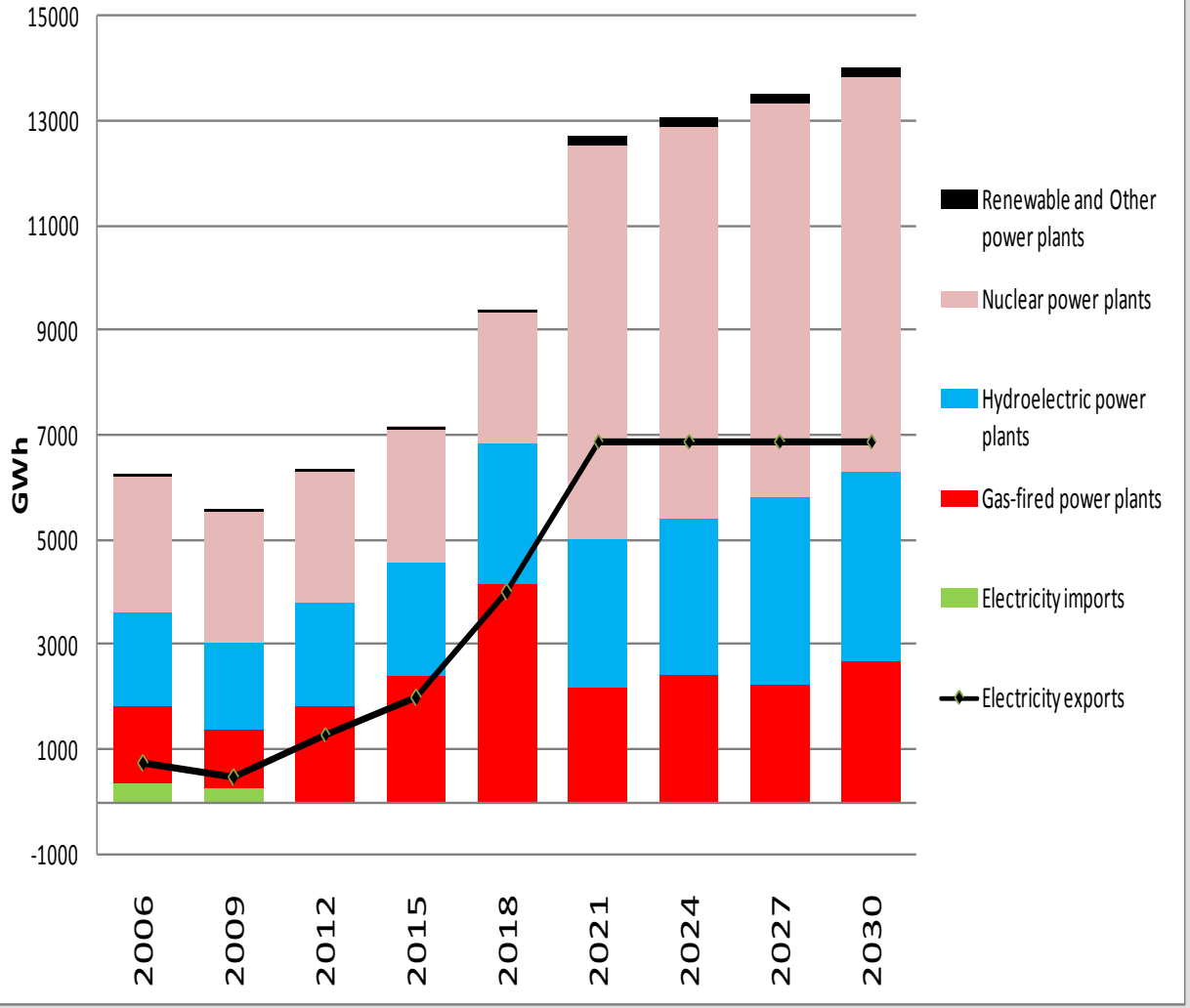
Reference Scenario – Primary Energy Supply

- Primary energy consumption in 2030 is projected to be 5,163Ktoe, increasing from 2006 levels by 95%
- The most significant component of primary energy growth is the growth in nuclear energy, which increases from 25% to more than >33% of total primary energy (much of the electricity generated is designated for export).



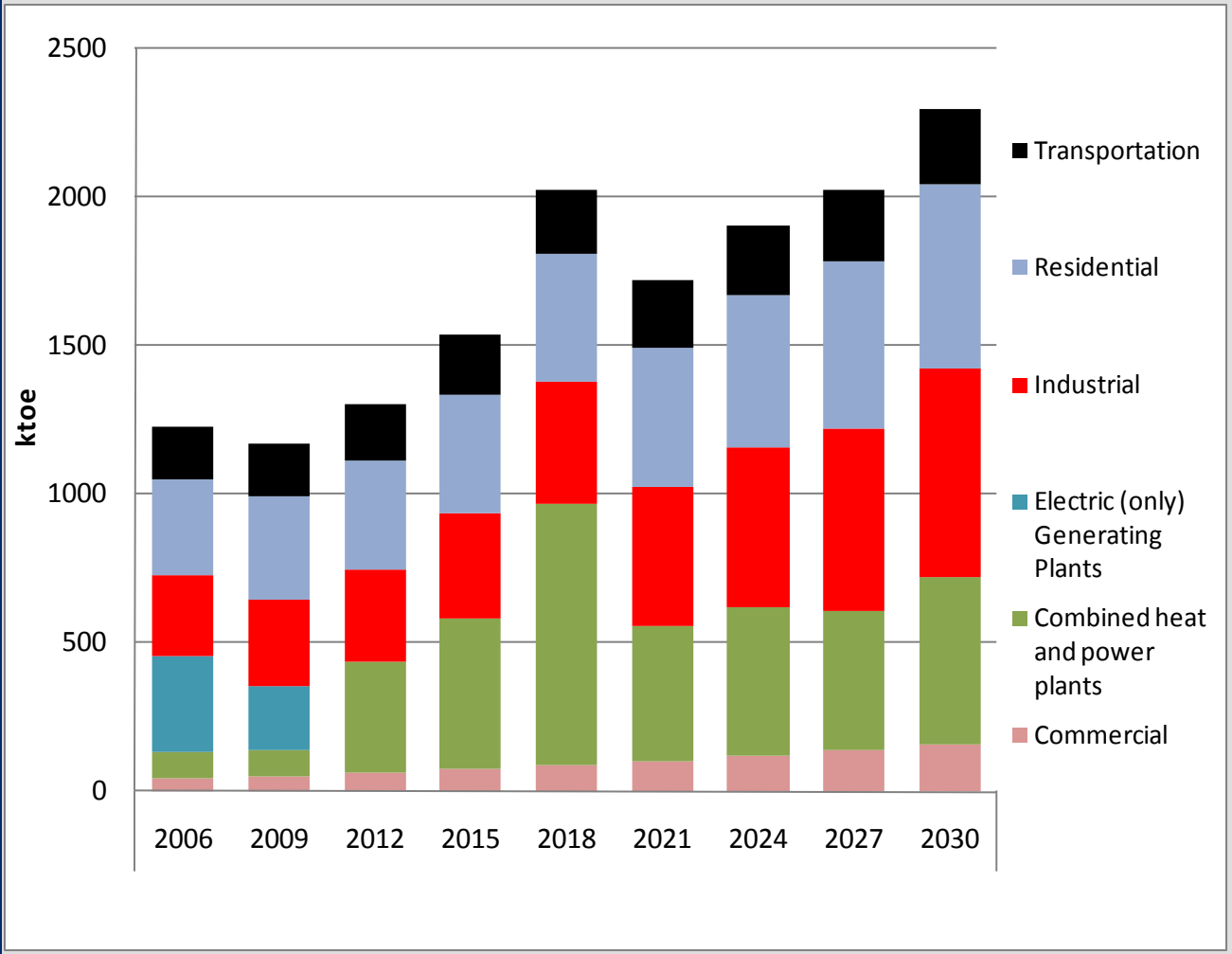
- Imports of natural gas allows gas to remain approximately 50% of total primary supply.
- Oil product imports increase (transport sector), although the share in primary energy remains at the same level.

Reference Scenario – Electricity Sector Evolution



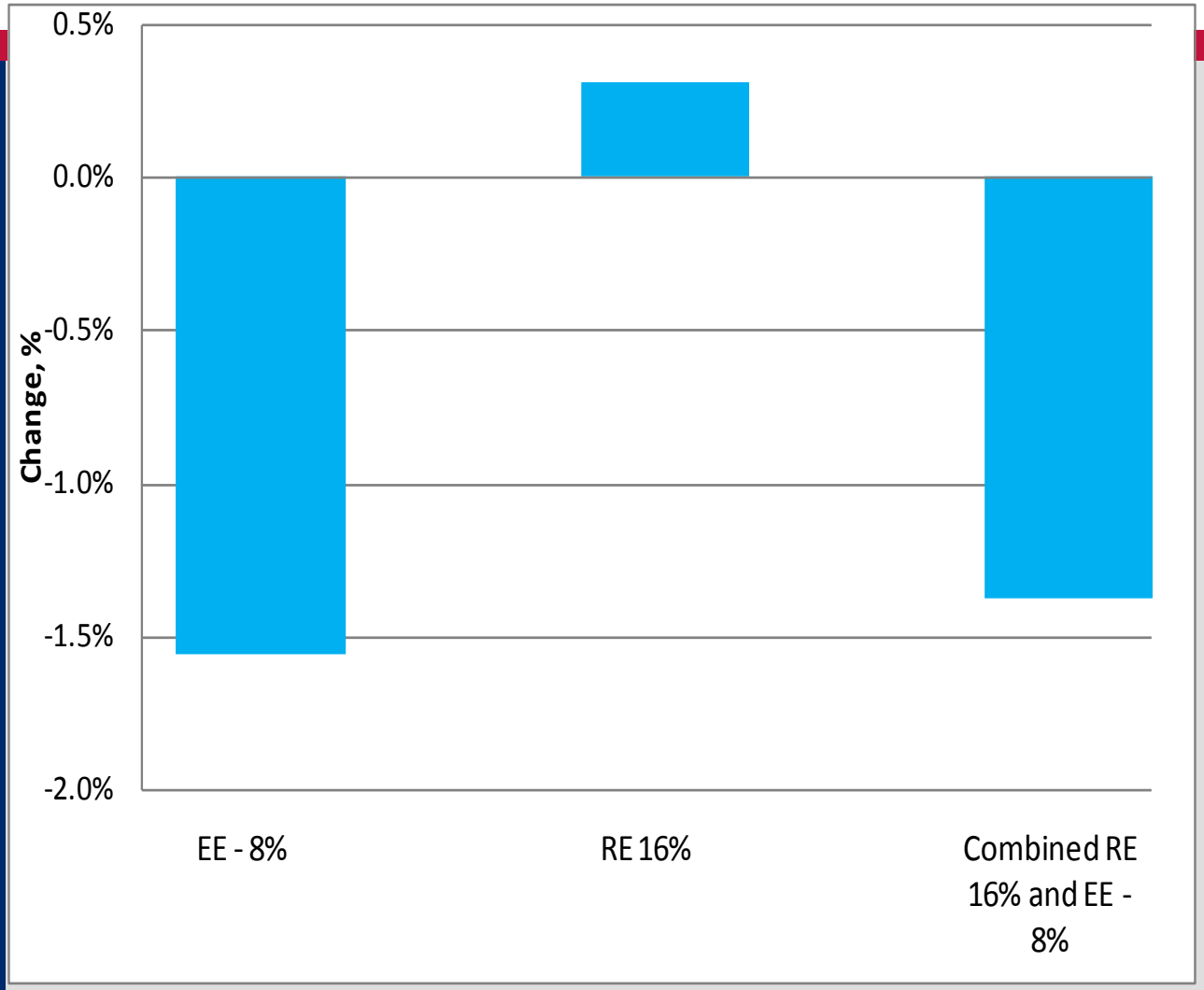
- 687MW of thermal capacity already added (in 2012) on existing 810MW
- After 400MW plant retires 1,000 MW of nuclear capacity adds (in 2021)
- New Hydro capacity of 650 MW added which provides 1.8GWh electricity
- 25MW of geothermal capacity added in 2021
- Electricity exports reach over 7 billion KWh in 2030 in accordance with the intergovernmental agreement regarding electricity/gas exchange (no exports on other directions)

Reference Scenario – Natural Gas Consumption



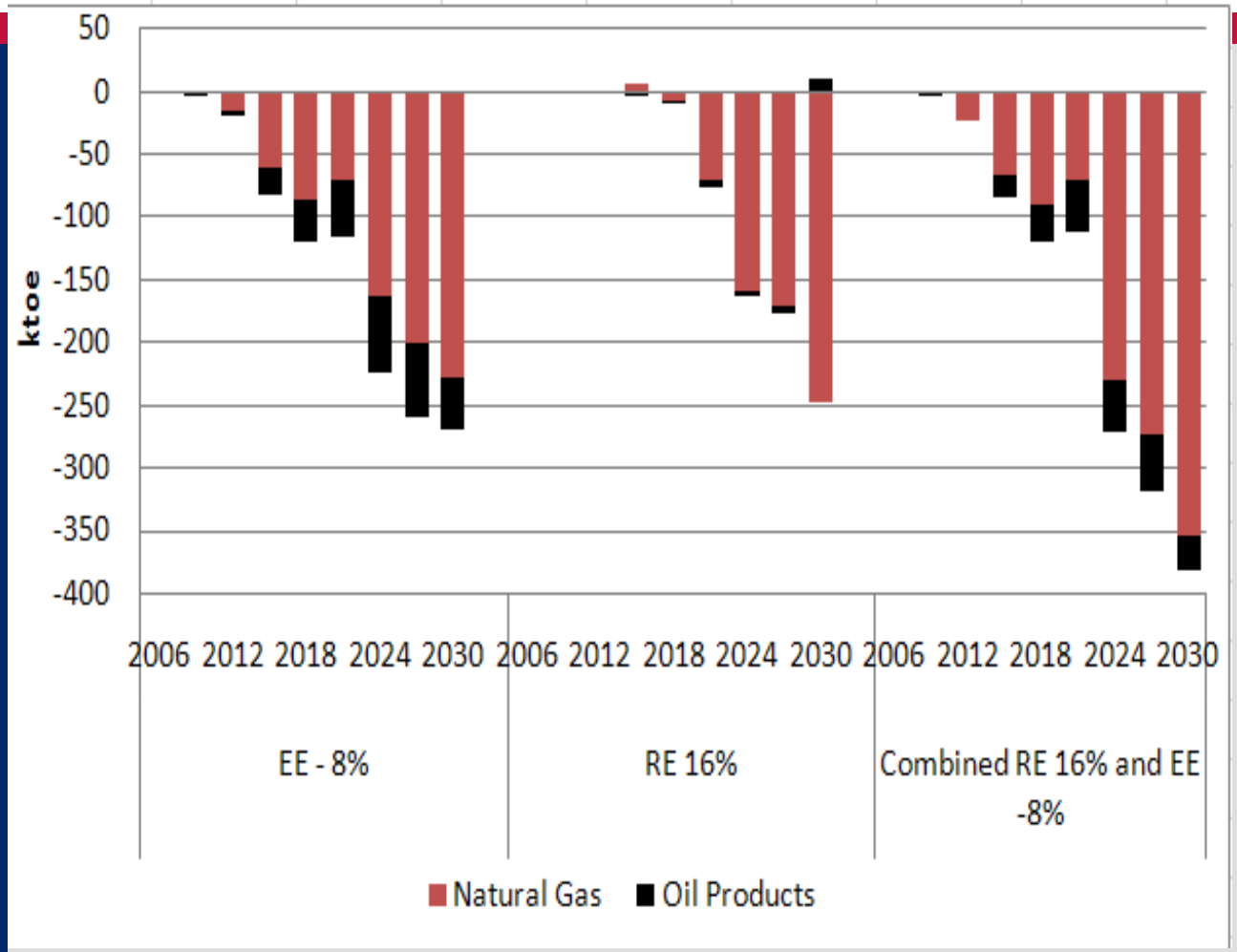
- Due to the increase of share of CNG vehicles gasoline consumption decreases by 44%
- In 2018 the CHP plant is ramped up to produce more electricity, till the new nuclear plant comes online
- In 2021 sharp drop is seen in power sector gas consumption, which is result of the new NPP coming online
- Residential sector gas consumption almost doubles over planning horizon
- Industrial gas consumption increases by 156%

EE&RE Goals: Change in Total Energy System Cost



- EE policies can save 358M€ or 1.56% compared to the Reference scenario
- To achieve RE target without promoting EE costs an additional 71M€ or 0.31%
- Combined policies result in achieving the RE target while still realizing an overall savings of 317M€

EE&RE Goals: Change in Imports

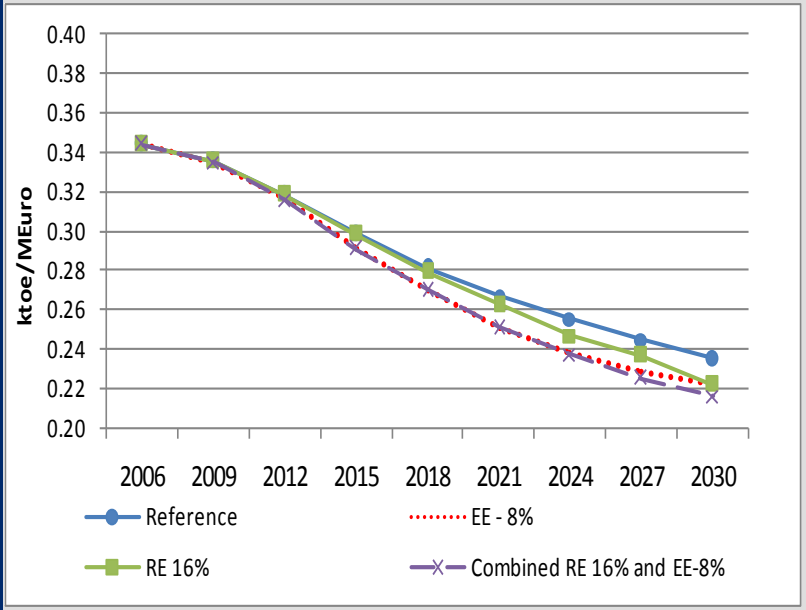


- Increased use of domestic RE resources reduces imports by 2.1%
- As a result of EE target oil-products imports reduce by 8% (273Ktoe)
- Natural gas imports decrease by 4-7% in different scenarios (1.1Mtoe in the Combined case)

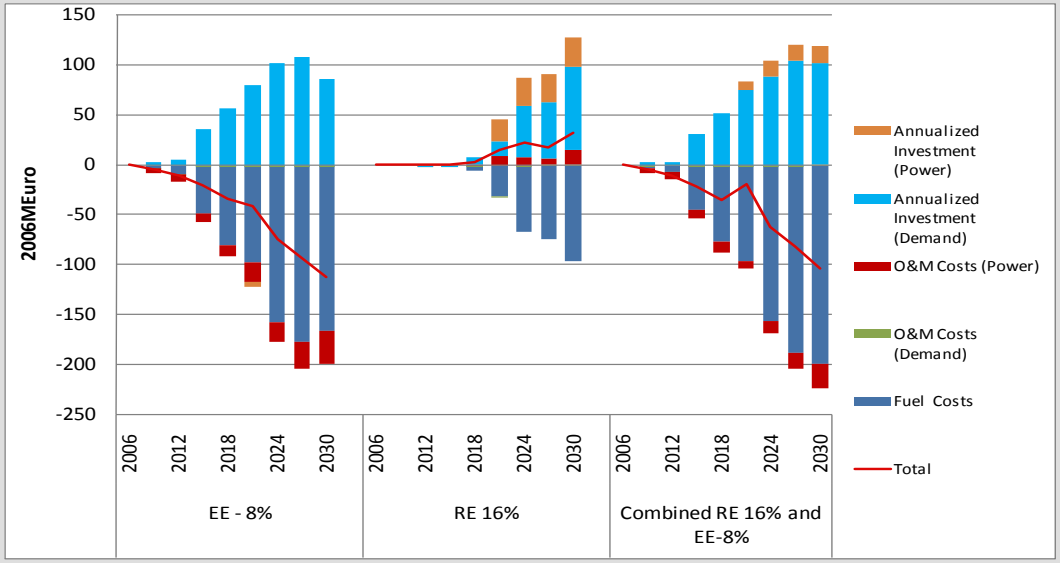
EE&RE Goals: Competiveness

Energy required per unit of GDP goes down in Reference by 32%, with an additional 5% drop in Combined case

Total Final Energy Consumption / GDP

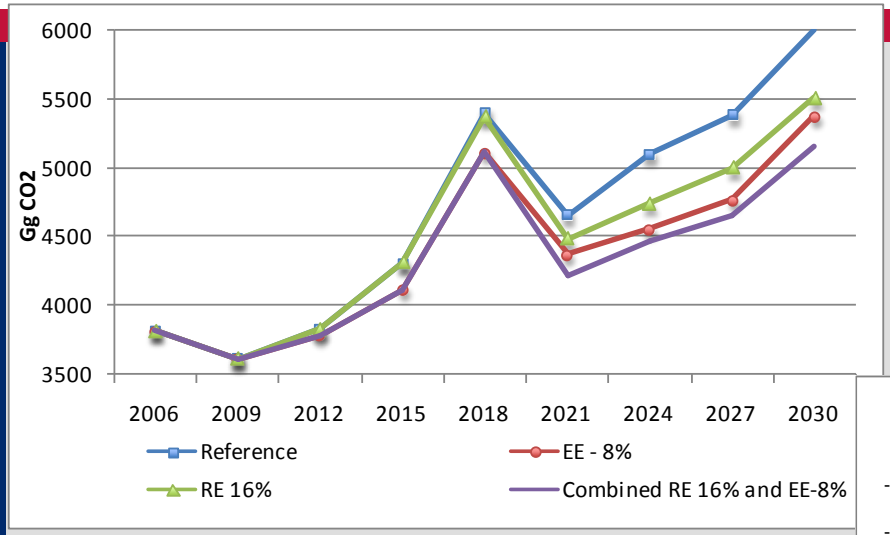


Energy System Expenditures and Savings (Change from Reference)



- Substantial fuel savings (in dark blue) can be seen under EE policies, reaching a cumulative reduction of 535M€ in the combined scenario
- Spending on improved demand devices is compensated for by the fuel savings
- Additional 108€M investment required to meet the RE target
- The combined scenario achieves an overall savings of 207M€ per year by 2030

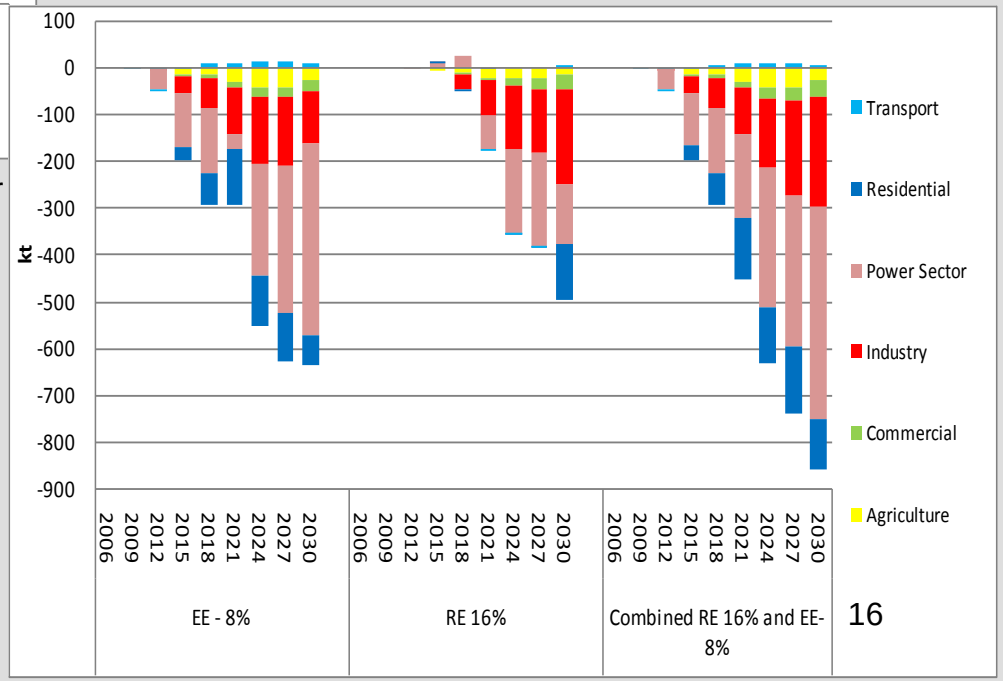
EE&RE Goals: CO_2 Emissions



- CO_2 emissions grow 57% by 2030 reaching 6,000Gg per annum under the Reference scenario
- Drop in 2021 by over 20% in all scenarios is a result of thermal generation sharp reduction due to nuclear generation increase
- Growth ≈1.5 times in 2030 compared to 2006 explained by over 80% generation increase in gas-fired plants, and total gas consumption and other energy carriers use growth of >60%
- Avoided CO_2 by scenario:
  - EE: 2,589Gg, -6.15%
  - RE:1,422Gg, -3.38%
  - EE+RE: 3,178Gg, -7.55%

- In the power sector emissions decrease by 15% (1550kt) in Combined scenario
- Noticeable reductions are seen in residential (2-8%) and industry (6-9%) sectors

(Change from Reference)



Thank You!

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