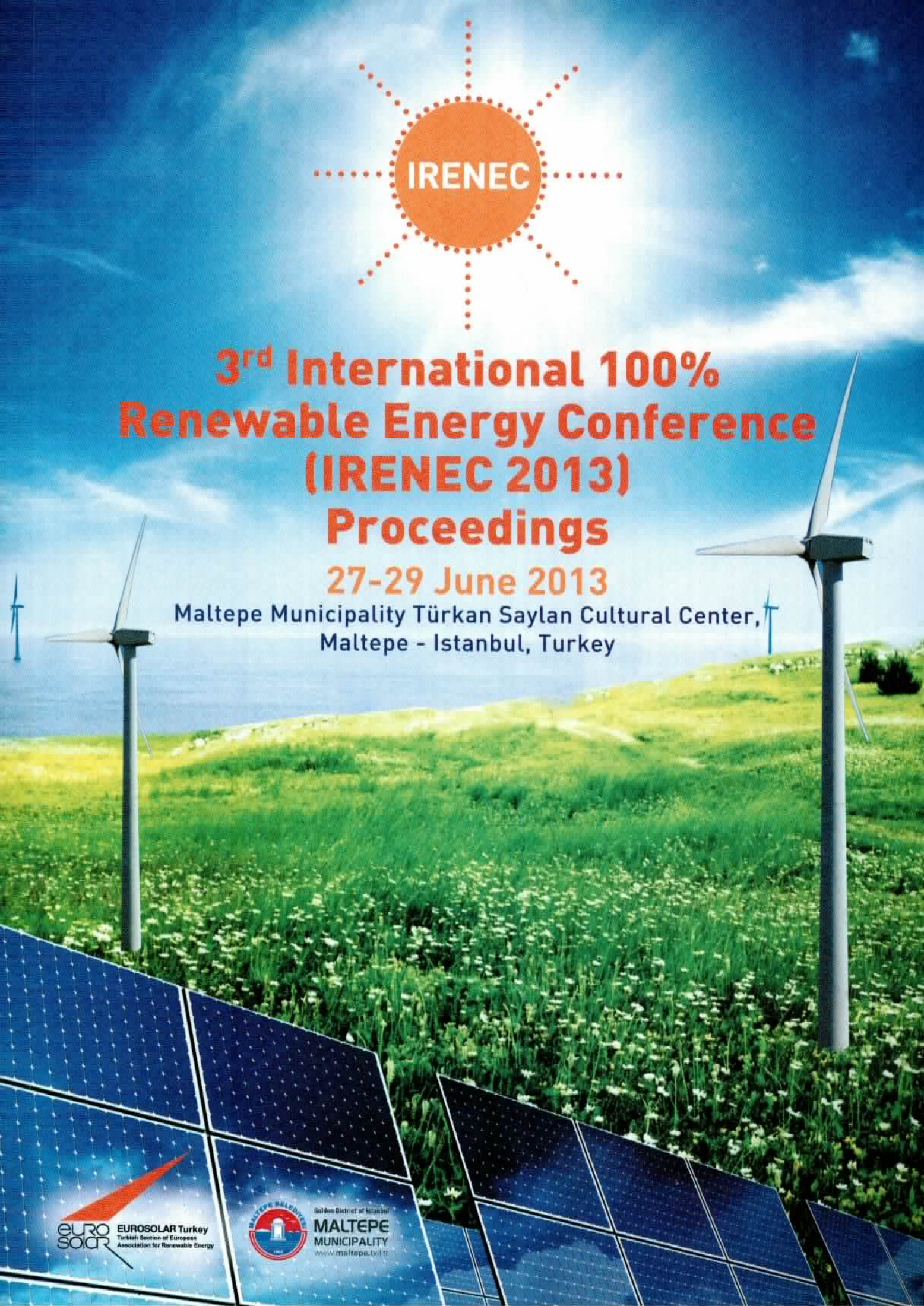


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# BRINGING EUROPE AND THIRD COUNTRIES CLOSER TOGETHER THROUGH RENEWABLE ENERGIES – OVERVIEW OF THE EU-PROJECT BETTER

Related Conference Topic: 5. Energy Policies, Legal Framework, Decision Support Models

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## ABSTRACT

BETTER intends to address RES cooperation between the EU and third countries. The RES Directive (2009/28/EC) allows Member States to cooperate with third countries to achieve their 2020 RES targets in a more cost efficient way. The core objective of BETTER is to assess, through case studies, stake-holders involvement and integrated analysis, to what extent this cooperation can help Europe achieve its RES targets in 2020 and beyond, trigger the deployment of RES electricity projects in third countries and create win-win circumstances for all involved parties.

The case studies focusing on North Africa, the Western Balkans and Turkey will investigate the technical, socio-economic and environmental aspects of RES cooperation. Additionally, an integrated assessment will be undertaken from the "EU plus third countries" perspective, including a quantitative cost-benefit evaluation of feasible policy approaches as well as strategic power system analyses. Impacts on the achievement of EU climate targets, energy security, and macro-economic aspects will be also analysed. This paper lays the focus on the study region Turkey and aims to give an overview of this dedicated work package, to inform on ongoing activities and to stimulate a strong involvement of relevant stakeholders in order to enable a more thorough understanding of the key factors at play in Turkey.

***Keywords:*** *Directive 2009/28/EC; RES cooperation mechanisms; Joint projects; Case studies; Cost-benefit analysis; RES financing; EU climate targets; Macro-economic analysis; Stakeholder consultation;*

## 1 INTRODUCTION

One major element of EU's external energy policy is expanding its energy norms and regulations to neighbourhood countries and beyond to achieve its energy policy priorities - safe, secure, affordable and sustainable energy supply. The importance of external energy policy has been acknowledged in the European Union's 2007 "energy package", and Second Strategic Energy Review (EC, 2008) and the European Commission's Communication on security of energy supply and international cooperation-"the EU Energy Policy: Engaging with Partners beyond Our Borders" (EC, 2011a). The EU Renewable Energy Directive (here after RES Directive) provides another element to cross-border cooperation by allowing Member States to fulfil their 2020 renewable energy (RES) targets by implementing joint projects in third countries. Even though the Member States' national renewable energy action plans (NREAPs) to reach their RES targets do not indicate any significant use of this mechanism, the RES Directive acknowledges the importance of renewable energy as part of external energy policy.

### 1.1 Background

Directive 2009/28/EC on the promotion of the use of energy from renewable sources (hereafter the RES Directive) lays down individual mandatory targets for the share of energy from

renewable sources in final energy consumption for each Member State. The Directive also defines indicative trajectories and corresponding interim targets for Member States. According to Article 3(2) of the RES Directive, Member States are under the legal obligation to "introduce measures effectively designed to ensure that the share of energy from renewable sources equals or exceeds that shown in the indicative trajectory". These measures can be of a purely national nature but they can also be based on cooperation between Member States and other countries to whom the RES Directive is applicable and on cooperation with third countries under certain conditions.

The RES Directive defines a set of mechanisms to facilitate cross-border support of energy from renewable sources as a tool to optimise the energy system. These mechanisms, which introduce flexibility for Member States on a voluntary cooperation basis, refer to:

- Statistical transfers between Member States (Art. 6),
- Joint projects between Member States (Art 7, 8),
- Joint projects between Member States and third parties (Art 9, 10) and
- Joint support schemes between Member States (Art. 11).

Within *statistical transfer*, Member States may agree to make arrangements for the statistical transfer of specified amount on energy from renewable sources from one Member State to another, while within Joint support schemes two or more Member States can decide to jointly or partly co-ordinate their national support schemes for RES production.

The concept of *joint projects* allows two or more Member States to cooperate on projects relating to the production of renewable electricity, heating and cooling meaning that one country having more favourable conditions to increase renewable energy production will host the project and the other country or countries will also benefit from the resulting power production. This co-operation mechanism may also involve private operators.

The Directive also enables one or more Member State *to cooperate with one or more third country in joint projects* regarding the generation of electricity from renewable sources.

The European Commission estimates that great savings can arise from an international cooperative approach in reaching EU Renewable Energy targets by 2020. Nevertheless, most member states still aim to focus on their natural resources and disregard the potential cost savings that can arise from the use of the cooperation mechanisms.

While several recent European and national projects have started to analyse potential benefits of the use of the cooperation mechanisms within Europe (e.g. the IEE project RES4Less), an analysis on the use of the cooperation mechanisms with third countries seems to be lagging behind.

The EU-project BETTER addresses these questions and focuses their assessment on the EU neighbour countries/areas North Africa, the Western Balkans and Turkey. This paper gives an overview on the EU-project BETTER and in particular focuses on the modelling activity within the case studies and the integrated assessment.

## 1.2 Objectives

First, the core objective is to assess through case study analysis as well as integrated analysis, to what extent the cooperation mechanism with third countries can help Europe achieve its RES targets in a cost effective way, as well as trigger the deployment of RES electricity projects in a mutually beneficial way.

Second, an action plan that fosters renewable energy production, transfer and use in the EU Member States and the third countries through cooperation mechanisms shall be developed.

Third, policy recommendations shall be drawn with regards to the implementation of the 4$^{th}$ cooperation mechanism for each case study and in general, as well as the comparison of these mechanisms with other RES cooperation instruments.

Fourth, a set of practical guidelines for project developers shall be elaborated in order to foster and promote the active involvement of private sector in the deployment of mutually beneficial renewable energy projects in third countries using the cooperation mechanisms.

## 2 METHOD OF APROACH

### 2.1 Country case studies

In three regions bordering the EU cases studies with strong stakeholder involvement will be carried out: North Africa, the West Balkan countries and Turkey. The objective of the case studies is to assess the potential and prospects for intensified RES cooperation between the EU and the investigated third countries in the 2020 timeframe and beyond from the regional perspective. This assessment includes also local co-effects (environmental and macroeconomic indirect effects) for the host countries. This, combined with the European perspective within the integrated assessment is the basis for the identification of win-win situations both for the host countries as well the EU.

In particular, we use a three-level framework addressing the *macro-level, the micro-level* and *acceptance issues*. Based on that framework, three fundamental questions are formulated, targeted at describing the overall case for cooperation between countries, the business cases for investors - including both financial and practical feasibility - and short- and long-term acceptability of concrete cooperation projects:

1. Is it macro-economically attractive for both importer and exporter countries (and possibly transit countries) to engage in RES cooperation (macro-level)?
2. Can these macro-economic benefits be translated into business cases, in terms of economic and regulatory conditions and administrative/practical feasibility, making specific projects attractive and implementable for investors (micro-level)?
3. What is the role of acceptance problems? (e.g. is it possible to get the necessary permits and build the project (short-term) and continue the cooperation process between countries (long-term), or are public and political opposition significant obstacles for the practical realization of projects and plans (acceptance)? How do socio-economic co-effects impact _the acceptance?

All three questions have to be answered positively for cooperation to happen, as each of the levels hold the possibility/threat of a veto. These three framework levels and parameters outlined above are not independent variables which can be looked at without acknowledging interlinks and correlations in between different levels and issues. As a consequence of this interdependent 3-leveled structure at several country levels, policy-makers as well as investors and other actors try to anticipate possible conflicts, opposition or triggers and maybe move their behavior towards conflict avoiding strategies.

As shown in Figure 1 this regulatory and policy action cycle loop can be seen as a complex interaction of expectations by different actors, their perception of the future and their activities in order to comply with their own and other interests. Interdependencies and reversal effects have to be considered since actors from one level (policy-makers, investors or pressure groups) may react on changes in another area. Accordingly, as an example, feed- in tariffs financed by a consumer levy may be the preferable instrument in respect of planning reliability and investment security, but may affect substantial opposition of consumers when they are not willing to “subsidize” projects abroad that do not benefit the national economy and are seen as a threat to energy autonomy. These perceptions may be foreseen by wise policy-makers who will thus create a specific policy framework which addresses these concerns. Consequently, these three levels cannot be looked at separately but are strongly interconnected and endowed with reciprocal co-effects.

With regard to the macro level quantitative results for technologically, economically and socially feasible pathways (including grid aspects) for RES(-E) deployment in the short (2020) to long-term (2050) w/o export perspective (to the EU) within the study regions are developed. The

modeling of the pathways will be done by applying the models *Green-X* and *HiREPS*. Moreover, an environmental and socio-economic impact assessment will be conducted in order to estimate the net effect associated to the implementation of cooperation mechanisms in Turkey.

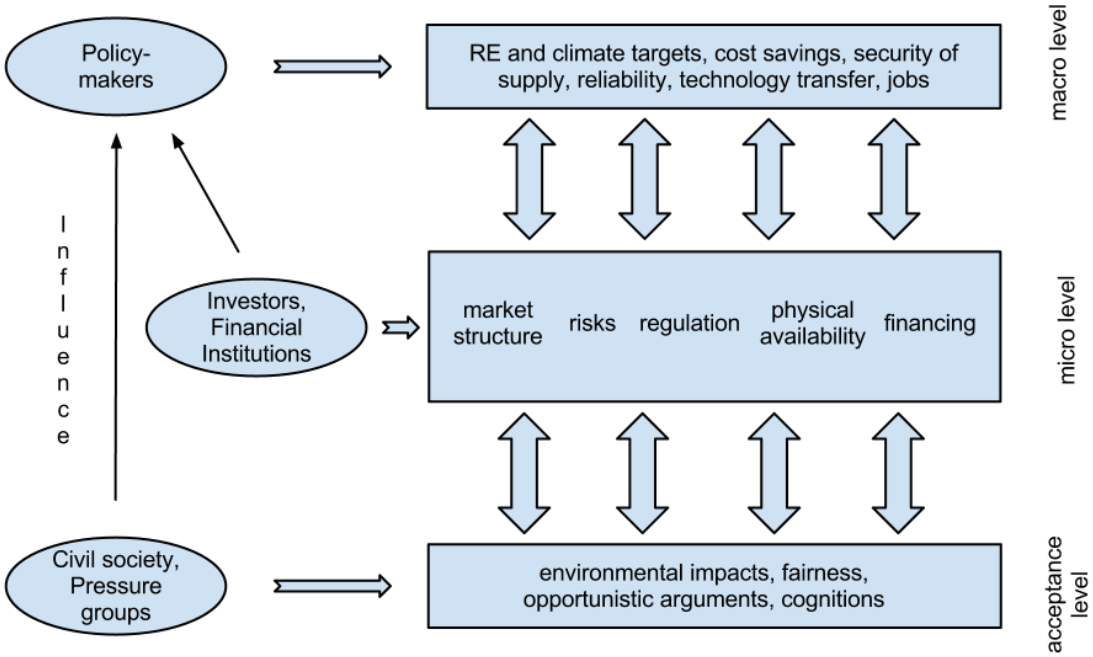


Figure 1: The regulatory and policy action loop

Within the case studies the involvement of stakeholders is essential. In addition to the regional workshops there will be bilateral key stakeholder meetings both in Europe as well as in the studied regions. Moreover, in order to include the most up to date regional information for the project, and to discuss the major findings of the project regarding renewable energy potentials, policy and regulatory frameworks, national energy planning and renewable energy success stories in the region, there will be an intensive dialogue with regional stakeholders just from the beginning and during the total duration of the project via email and other telecommunication options as well as taking the opportunity for meeting at regional events and conferences.

## 2.2 Integrated assessment (EU 27 + third countries)

An integrated assessment will analyse to what extent the cooperation mechanisms with third countries can help Europe achieve its RES targets in 2020 and beyond, trigger the deployment of RES electricity projects in third countries and create synergies for all involved parties. The identification of costs and benefits in the EU and in third countries related to the enhanced RES deployment under varying scenario conditions forms the quantitative model-based part of an integrated assessment, whereby a specific focus is set on power system simulations (HiREPS model) and on the identification of necessary energy policy prerequisites (Green-X, Resolve-E model). Figure 2 gives an overview on the applied energy models. Furthermore, the integrated assessment will also take into account co-effects on a European level – e.g. impacts on the achievement of EU climate targets, energy security, air pollution, as well as social and macro-economic aspects. Some of these effects can be quantified, some of them will be considered in a semi-quantitative or qualitative way.

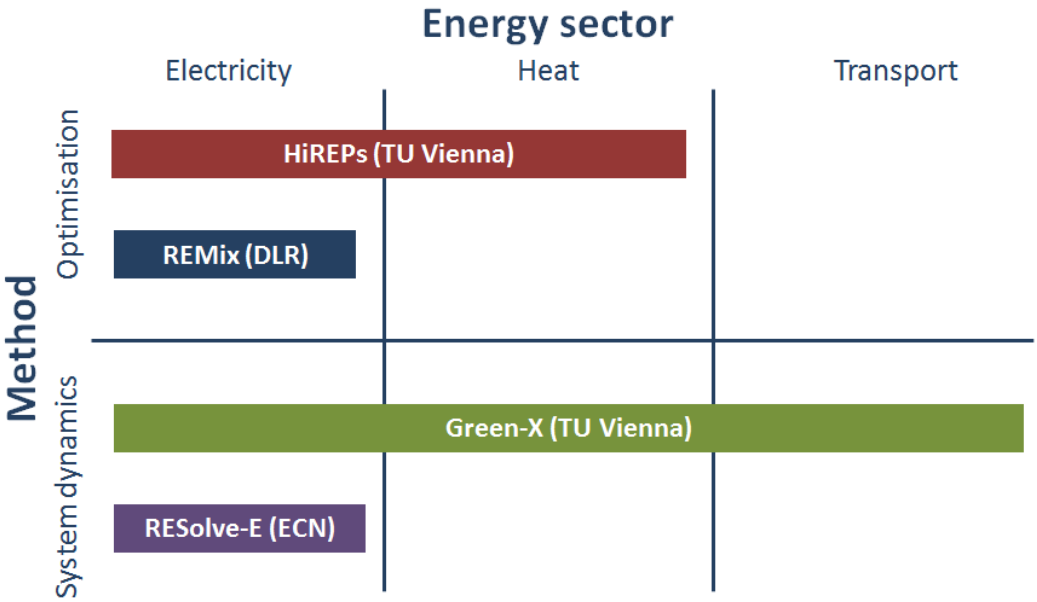


Figure 2: Applied energy models within the integrated assessment

The work performed in this assessment is closely linked to the three case studies – i.e. data gathered and policy needs identified for the case regions will be incorporated into the work within integrated assessment, while information on the short-term 2020 perspective from the integrated viewpoint will loop back into the case studies. In general, this shall also contribute to the consistent comparison of qualitative results by taking them into account in an appropriate manner partly within the quantitative analysis and partly complementary to that. Finally, this integrated assessment will form a solid basis for the subsequent derivation of policy conclusions and the preparation of detailed action plans.

## 3 PRELIMINARY CONCLUSIONS AND OUTLOOK

Countries in the *Western Balkan region* have great unexploited potential of renewable energy sources (RES), including biomass, wind and hydro, which could by efficient use significantly contribute to security of supply within the region and wider. Contrary to EU average energy consumption patterns that indicate a steady reduction in the use of petroleum and coal/lignite at the expense of natural gas, nuclear energy, and renewables, the Western Balkans are moving in the exact opposite direction. The EU-West Balkan Case study targets the West Balkan countries Croatia, Serbia, Macedonia, Albania, Kosovo, Montenegro and Bosnia. Several of these countries are EU accession candidates and some of them may enter the EU before 2020. All of the West Balkan countries are part of the Energy Community treaty that is assisting them to implement the EU RES directive. Some initial discussions of the possible use of cooperation mechanism in the West Balkan countries have already started. Serbia and Italy are currently in the negotiation phase of a joint project regarding a hydro power plant.

*Turkey* is characterised through strongly growing electricity demand (7% average growth 2002-2008) that is expected to double until 2020. Due to this growth Turkey has a strong demand for investments and modernization of the power system. In this WP it is analysed how cooperation, and in particular the 4th cooperation mechanism as defined in the RES directive, could trigger strong investments in wind, solar, hydro and other RES and the resulting market potential for national and European companies. Currently the hydro capacity of Turkey is 14.5 GW and the annual production about 45.5 TWh/a. This is similar to Sweden a very large European hydropower producer. The economically feasible hydro potential is about 140TWh/a. A likely co-benefit from increased cooperation for EU and Turkey will be the large hydropower capacities in Turkey providing balancing power for the fluctuating renewable energies in Europe. But despite that most

of the Turkish hydro capacity is the form of reservoir power plants, there are presently no pumped storage power plants in Turkey. Thus, an estimation of the economically, environmentally and socially feasible potential for pumped hydropower plants to balance the EU RES-E volatility will complement the overall assessment within this WP. The perceived strong support by the power companies Verbund and Enerjisa shows that this is a real question of significance.

Currently on-going and future work comprises:

- Data collection with regard to the current state of energy systems (energy balances, generation mix, grid infrastructure, demand development, …)
- Prospects for wind, solar and biomass (Western Balkans) energy in the case study regions
- Prospects and impact of new pumped hydro power plants at existing reservoirs and lakes under the condition of increased cooperation with EU
- Grid infrastructure additions required for national targets
- Grid infrastructure additions required for export or increased international balancing of volatile RES-E (preliminary identification of potential export potential)
- Identification of local/regional priorities regarding the development of the energy sector
- Required adaptation of the power plant mix to integrate high shares of volatile renewable power
- Assessment of the economically optimal share of wind and solar power: wind and solar power partly balance each other and a proper combination strongly reduces the power system integration costs of the renewable energies
- Identification of investment requirements and business opportunities within the regions

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## BIOGRAPHIES

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