The integration of European electricity markets has become a priority issue for EU energy policy. Market integration offers the prospect of a more cost-effective and competitive power system, enhanced security and cross-border solidarity, and the potential for integrating greater proportions of variable renewable power.
>Accessing these benefits requires both development of the necessary infrastructure and alignment of market rules and policies – a process that remains far from complete.
>While steps towards market integration are progressing at European level, regional approaches allow many of the benefits of market integration to be attained more swiftly while recognising national specificities. A number of differing regional approaches have been developed in different parts of Europe.
>The South East Europe region has much to gain from European power market integration. More interconnected power systems allow costs savings from both reduced capital investment requirements for generation, and lower operational costs from better optimised system.
>The region's power system is strategically important for Europe as a whole to deliver Europe's mid- and long-term energy and climate objectives. Until now, however, this potential has not been fully captured.
>A dedicated regional dialogue is needed to bring political momentum towards accessing these benefits.
The integration of European power markets and development of the associated infrastructure is expected to have significant benefits, not only at national but also at regional level. The South East Europe region stands to gain significantly from market integration and sharing of abundant renewable resources. However, despite significant European focus on gas infrastructure development in the region, the potential for South East Europe regional collaboration on electricity infrastructure and market integration has not been fully recognised. This paper outlines the importance of market integration and regional collaboration on electricity infrastructure and adequate generation capacity for the South East Europe region, and identifies relevant models from elsewhere in Europe.
Infrastructure and market integration
The potential benefits of European power market integration are substantial:
>An assessment for the European Commission found that energy market integration across Europe could save up to €40 billion per year by 2030, with further savings of up to €30 billion per year possible through moving to a unified market for renewables
>A study commissioned by the European Climate Foundation identified that a total cost saving of €426 billion by 2030 is achievable as a result of increased system efficiencies through more interconnected markets
Around a third of the savings potential come from savings in capital investments costs, whilst the remaining two thirds are the result of reductions in operational and fuel costs.

That means that the bulk of the savings come from physical interconnection and optimising system operation – i.e. making best use of the most efficient power plants on the system – with a smaller share attributable to optimal siting of renewable generation assets.
>A new paper by Accenture for Eurelectric suggests that a combination of optimised renewable energy systems, market integration, active system management and demand response and energy saving could deliver benefits of €27 to €81 billion per year by 2030. These economic benefits are supplemented by the role that market integration and regional collaboration can play in protecting security of supply by enabling cross-border solidarity in case of supply disruptions, by diversifying energy sources, and by developing storage systems. In addition, as noted by the European Commission's European Energy Security Strategy, "competitive and liquid markets provide an effective hedge against abuses of market or political power by individual suppliers.
Delivering the network infrastructure at sufficient scale and speed to fully enable these benefits will, however, be a significant challenge. European Commission Roadmaps suggest that rates of overall grid investment would need to double by 2025, and triple by 2040. Electricity TSOs are currently planning to increase their rate of investment by 70% out to 2020. Capital investment requirements for power transmission in Europe are expected to be in the range of €114-184 billion by 2030 and €273-420 billion out to 2050. Yet ENTSO-E notes that a third of projects from its 2010 Ten Year Network Development Plan have already been delayed, partially as a result of lengthy permitting procedures.
South East Europe power market and infrastructure challenges
In its broadest sense, the South East Europe region can be understood to include EU Member States (Hungary, Romania, Bulgaria, Greece, Cyprus, Croatia, Austria, Slovenia, Italy and Malta), the Western Balkans (Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia, Montenegro, Serbia, Kosovo* and Albania) and other non-EU States (such as Turkey and Moldova). However a number of studies and initiatives for South East Europe include only a subset of these countries, as a number of different configurations are possible. In this study South East Europe refers to the wider region and includes all countries mentioned above.
The South East Europe (SEE) region is in a strong position to benefit from power market integration and regional collaboration on infrastructure:
>The region is moderately interconnected as a legacy of historical investments, but nevertheless requires significant investment to respond to the changing power profile in the region and overcome key bottlenecks (see figure below). ENTSO-E estimates at least €10.8 billion needs to be invested in power transmission projects in the region by 2020.
>An ageing power plant fleet in many countries in the region means there is high value in making most use of the newest and most efficient plant. Over 35% of the power capacity of Romania, Hungary, Bulgaria and Slovenia is expected to close between 2010 and 2020,

Integrated power markets also help to ensure energy security during asset replacement cycles.
>Swiftly developing variable renewable resources in the region can be incorporated more cost effectively into an integrated system, through enabling system balancing to take place over large areas. With 30-50% better solar irradiation than Germany and substantial amount of wind available (especially in Greece, Romania and Turkey), both solar and wind potentials are considerable.
Major new increments of variable generation from wind and solar plants would have to be balanced by output from large hydro plants, gas plants, hydro pumped storage facilities or more advanced energy storage technologies. Meanwhile, the considerable deployment of decentralised solar PV already underway in the region will mean there is a pressing need for 'smarter' distribution grids to optimise use of these resources. In this context, a regional planning process and energy strategy to jointly optimize electricity generation, transmission infrastructure, and the demand side could help advance cost-effective renewable power investment options and achieve economies of scale.
>South East Europe has considerable hydroelectric power generation capacity in place and significant potential to develop this further. Deutsche Bank estimates that only 40% of the cost-effective hydro potential in the region has been developed and the remaining 60% of economically viable potential is waiting for investors.
>The region has the highest potential for energy efficiency improvements in the EU, a key source of value in creating a more cost-effective and sustainable energy system. Bulgaria and Romania have the lowest level of energy efficiency in the EU while most countries in the Western Balkans have very low energy efficiency standards. Regional collaboration on energy efficiency could be beneficial for attracting investments, exchanging best-practices, and accessing regional funds.
>The region is also strategically positioned to provide a link to North Africa, other Black Sea countries, such as Moldova and Ukraine, and other European neighbourhood countries and thus forms an important corridor for power exchange. These areas are expected to see rapid development of cost-effective renewable power generation as well as significant demand growth. Synchronisation with Turkey is already underway.
The opportunity to address these shared challenges through regional collaboration is considerable. A regional policy framework that includes a more rapid deployment of electricity interconnections, renewable generation, as well as energy efficiency would enable national energy plans to be better aligned with EU climate and energy policy objectives. Electricity interconnections foster diversification of energy supply in an affordable and sustainable manner as well as enable access to, and integration of, energy markets.
European infrastructure objectives

Cross-border energy networks are recognised as a European priority in the Lisbon Treaty:

To enable citizens of the Union, economic operators and regional and local communities to derive full benefit from the setting-up of an area without internal frontiers, the Union shall contribute to the establishment and development of trans-European networks in the areas of transport, telecommunications and energy infrastructures.
Within the framework of a system of open and competitive markets, action by the Union shall aim at promoting the interconnection and interoperability of national networks as well as access to such networks. It shall take account in particular of the need to link island, landlocked and peripheral regions with the central regions of the Union.
Despite this recognition in the treaty, trans-European energy networks have been slow to develop. In 2002 at the European Council meeting in Barcelona, heads of government committed to a target for Member States to achieve a level of electricity interconnection equivalent to at least 10% of their installed production capacity by 2005. However, in the absence of sufficient delivery mechanisms or oversight on progress, the Barcelona target continues to be unmet, with 12 European countries remaining below the 10% threshold in 2011.
The 10% target was reaffirmed by Heads of Government at the European Council meetings on energy in May 2013 and March 2014, and has been useful for focusing attention on the importance of interconnection. The March 2014 European Council also called for the European Commission to propose new interconnection objectives for 2030, and in its European Energy Security Strategy the Commission put forward a proposed objective for 2030 for Member States to achieve at least 15% interconnection capacity.
The majority of South East European countries within the EU have achieved the 10% objective ; however further interconnection will need to be developed for countries to meet the 15% goal and beyond in order to accommodate future energy needs cost-effectively.
At the May 2013 European Council meeting, Heads of Government also reaffirmed a commitment to eliminate ‘energy islands’ in Europe by 2015, and to complete the internal energy market by the end of 2014. In practice, this latter goal will primarily imply completion of the European Network Codes rather than full market integration across Europe.
European institutional frameworks for market integration
In recent years, progress has been made toward developing a more European approach to energy network development and towards European power market integration. The EU Third Energy Package, the legislative package adopted in 2009 for increasing competition and integration of EU’s electricity and gas markets, established the European Network of Transmission System Operators for Electricity (ENTSO-E) and the Agency for the Cooperation of Energy Regulators (ACER). Their mission is to complement and coordinate

the work of European TSOs and regulators towards the completion of the single EU market. The Third Energy Package also introduced a requirement for ENTSO-E to publish a nonbinding Ten Year Network Development Plans (TYNPD) every two years. Progressive iterations of the TYNDP have moved from 'bottom-up' aggregation of national plans towards the inclusion of 'top-down' European scenarios.

The Third Energy Package also introduced a requirement for ENTSO-E (with guidance from ACER) to develop Network Codes governing network and market operation in the EU. The codes cover areas such as operational security and electricity balancing, and should – in theory – be completed in 2015.

In recognition of the need to accelerate development of key infrastructures, in 2013 the new Trans-European Network Guidelines for energy created a system of Projects of Common Interest (PCIs) that may benefit from faster permitting regulations and access to limited financing mechanisms through the Connecting Europe Facility (CEF) fund, which allocates a total of €5.85 billion to trans-European energy infrastructure for the period of 2014-2020.

Regional collaboration

These European level approaches to market development are supplemented by both 'top-down' and 'bottom-up' modes of regional collaboration. These regional approaches, it has been noted, "aim to hone the effectiveness of EU energy policy objectives through enhanced policy coordination at the regional scale".

In some cases, regional approaches have been developed in relative isolation to address specific market or policy barriers; in others, strong regional dimensions have been designed into European processes and objectives.

TEN-E Regional Groups

A key example of a 'top-down' regional approach is seen in the EU's Trans-European Network for Energy guidelines, adopted in early 2013. . This sets out a list of 12 'priority corridors', 4 of which for electricity, including for example the North Seas offshore grid and the Baltic Energy Market Interconnection Plan. A 'regional group' made up of member states, regulators and TSOs will be formed for each of the priority corridors in order to evaluate and rank project proposals.

The SEE is included in the North-South Interconnections East Electricity corridor, a large grouping that runs all the way from the Baltic Sea to the Aegean Sea. This strategic corridor alone includes half of all electricity transmission projects identified. However – as indicated in figure 3 – non-EU countries (e.g. the Western Balkans) are not included in the regional group. This contrasts with the system of regional groups for gas, where third country projects are included. The regulation also identifies the PCIs and specifies that if projects are unduly delayed by more than two years, they may be turned over to third party developers to ensure they are completed. The governance structures set up by the Energy Infrastructure Regulation represents a significant milestone. Projects will be evaluated and

ranked according to their impact on a regional level, rather than a solely national basis. The time limits on permitting will, in some cases, lead to faster decisions, while CEF financing should help to accelerate some key strategic projects.
However the system of priority corridors and PCIs has a number of limitations. Unlike the interconnection target, there is no quantification of the capacities to be delivered along the priority corridors – and thus no way of determining whether objectives have been met. Accordingly, the corridors can seem rather vague, and collectively they cover the whole of Europe. Regional Groups also currently play a rather passive role: they can rank project proposals but not solicit new proposals or set regional objectives. This constrains the scope of the Regional Groups to proactively develop shared strategies for infrastructure or even to define a set of outcomes that the regional groups seek to achieve – and points to the need for parallel initiatives for political collaboration on strategic direction.