While exports lead to increased production costs in one country these are significantly lower than the corresponding reduction of production costs in second country. In contrast, while imports have only a negligible impact on market prices and thus market payments in country 1, they result in marked increase of the market price and thus market payments in the much smaller country 2. Any changes in market payments are not only a function of changes in costs, but that they also signal a redistribution of income between producers and consumers.

South East Europe electricity market is in the EU mentored liberalization process. Energy Community has a big role in the policy harmonization area along with other key electricity institutional actors. However there are several issues and experiences from EU, which if properly analyzed and implemented in the SEE region, could be speed up the overall market liberalization effects and connect the region with EU markets. A well-functioning energy market should provide price signals which promote efficient investments in regional power market and security of supply. A generation company or a big consumer would be a natural candidate for building merchant interconnectors. They could themselves benefit from the interconnector capacity for additional exports or imports. Even more important could be the influence on prices in the price zones which the interconnector is connecting. A generator would build export capacity to increase the price level in its own zone. Thus the logic of a generation company building a merchant line would be quite similar to the logic of a vertically integrated TSO building the line. The difference is in the treatment of congestion rents which in the case of a TSO are considered to be part of the regulated income but in the case of a merchant investor can generate non-regulated profits, depending on the exemption decision.

Serbia Energy brings the analysis of various reports covering SEE market coupling and connection with EU. Market mechanisms like congestion management mechanism, transits via few areas, investments in generation and transmission power system facilities and risk management are influencing electricity trading and investment solutions. Solutions in European electricity markets are converging to market coupling firstly via regions and after region coupling in single electricity market. Although the situation is better in comparison to start of liberalization process there are still different imbalances which can be solved with more efficient mechanisms.

The Electricity Regulatory Forum (Florence Forum) is currently addressing cross-border trade of electricity, in particular the tarification of cross-border electricity exchanges and the management of scarce interconnection capacity. Possible solutions regarding efficient investment in generation and transmission and security of supply are integration of renewables into the market (power exchanges), Energy Infrastructure Package, Regional/European Union (EU) generation adequacy assessment, EU compatibility criteria for Capacity Remuneration Mechanisms according to Eurelectric, and efficient congestion

management mechanisms (with better definition of bidding zones).
Basic criterion for market integration is: benefits ≥ costs. Golden rule: the easiest to implement provide the most benefit. It is necessary to have a broad perspective and consider both technical and economic elements and market. There are inter-relationships between mechanisms for congestion management, transit, trading, investments, and tariffs. How do these models interact? Power exchanges have boost electricity trading as well as continued market integration process. Markets in different stage of development and liquidity on power exchanges also impact on electricity market development. Investors look on long term signals via physical and financial products – hedging future risks. Presently, power markets receive distorted market signals and in some cases peak prices are lower than base prices as well as the difference between peak prices and base prices are less and less. Final end-user prices are on the rise while wholesale prices are going down (taxes and levies are piling up) – e. g. wholesale price is only 15% of the total end-customer price in Germany.
Regulation on Trans-European Energy Infrastructure Guidelines addresses infrastructure challenges to ensure true interconnection in the internal market, integration of energy from variable renewable sources and enhanced security of supply. For projects identified as projects of common interest (PCI), the Regulation introduces measures to accelerate permitting procedures, including through a maximum time-limit and streamlining of environmental assessment procedures. The Regulation also provides better incentives to investors through enhanced regulatory provisions, and it sets the conditions for EU financial assistance under the proposed Connecting Europe Facility.
The lack of proper price signals to market participants leads to the sub-optimal utilization of networks and generation resources, and also to sub-optimal investment signals. ACER Framework guidelines on capacity allocation and congestion management (2011) and ENTSO-E Network Code on capacity allocation and congestion management (2012) is trying to make more efficient congestion management methods with impact on market participants. Bidding zones should be along structural congestion lines rather than national borders. European countries use zonal pricing with different implementation: price zones fixed and equal to country (e. g. Germany, Belgium, France); price zones fixed, but several zones within a country (e. g. Italy, Norway, Sweden); smaller price zones flexible according to network congestion or full nodal pricing (under investigation).
Congestion management is one of the main concerns. It has an impact on the level of electricity prices and it should be a key instrument for determining investments in generation and transmission. Today, each area has its own clearing rules and its own allocation techniques. The challenges are therefore to study and implement new options that would increase overall electricity market efficiency and reduce congestion costs significantly. The successful implementation of flow-based market coupling approach should

be extended to address congestion management, balancing markets and capacity reserve markets within a joint unified approach all over Europe leading to a set of coherent interacting tools able to address all these complex issues at once.
Given a congested two node network the marginal increase of capacity will provide the investor with a dividend equal to the shadow price of the transmission constraint if he is rewarded by a financial transmission right. Extension will take place until the costs for new capacity equals the shadow price of congestion. In contracts an incumbent will weigh the investment costs with the reduction of congestion rent from its inframarginal units.
Congestion cost is a good measure from a society perspective, but not a fair measure of TSO short term performance. This indicator is affected by merit orders on both sides of the border which are the major drivers for congestion costs. Maximization of cross-border capacities has a clear value to cross-border trade and can to a large extent be influenced by TSO. A small improvement could increase available capacities across all timeframes (which can be a critical market benefit even if realized only for a few hours per day). But maximization of cross border capacities at all costs should not be rewarded.
Real congestion rent usually remains below the theoretically possible congestion rent. There are several reasons for this. Capacity is not always available due to outages or due to curtailment of capacity for network security reasons. Another reason is that in most European interconnections congestion rent is not gathered from implicit auctions but from explicit auctions or from a combination of these two types of auctions. Explicit auctions give a congestion rent based on traders' estimate of the price difference, not on the final price difference. Usually implicit auctions give a higher rent for the TSO as in explicit auctions the uncertainties for traders are higher. As congestion revenues indicate how much market participants value the possibility for cross-border trade, congestion rent could be a good criterion to determine at which interconnection capacity should be increased. Congestion rent can be easily compared with the cost of any potential investment to remove congestion.
In many countries congestion rents are collected from several borders. An interconnector investment affects the market price and thus also affects congestion rents at all borders, not only at the border at which the new inter-connector is built. Thus it is necessary to take into account the combined effect, not just the increase of congestion rents at one border.
The congestion rent declines when the cross-border capacity is close to the price convergence level. This decrease in congestion revenues could discourage TSO to invest up to the overall welfare optimum level. TSO not interested in undertaking efficient investment projects would have to transfer the congestion rents to a "Regional Interconnection Fund" to finance other interconnection projects of regional interest.
The social and economic welfare benefit is calculated from the reduction in total generation costs associated with the grid transfer capabilities (GTC) variation that the project allows. By removing network bottlenecks that restrict the access of generation to the full European

market, a project can facilitate increased competition between generators, reducing the cost of electricity to end consumers. Similarly, a project can contribute to reduced costs by providing a direct system connection to new, relatively low cost, generation. This cost reduction is calculated from an economic assessment to determine the optimum cost of total generation dispatch, with and without the project.
Increased interconnection capacity does not automatically lead to increased welfare to consumers when summing up the effect on both sides of the border. For example if the supply curve in the exporting country is very steep and in the importing country very gradual, the result of building an interconnector is a substantial price increase in the exporting country but only a slight price decrease in the importing country. In these circumstances, overall social welfare for consumers will be reduced while overall social welfare for producers will be increased. An inversed slope of the supply curves would give the opposite result. This view only takes into account the effect on the electricity market in the respective countries caused by the new interconnector. While exports lead to increased production costs in one country these are significantly lower than the corresponding reduction of production costs in second country. In contrast, while imports have only a negligible impact on market prices and thus market payments in country 1, they result in marked increase of the market price and thus market payments in the much smaller country 2. Any changes in market payments are not only a function of changes in costs, but that they also signal a redistribution of income between producers and consumers.
The main role of power plants and interconnectors is, in addition to providing system security back-up to national systems, to optimize the overall system by allowing some higher cost generators to be replaced by lower cost generators in the regional dispatch. This means that a regional approach based on optimizing social welfare when deciding on building an interconnector or power plant is very appropriate. So if the investor goals in investment are the same as increase of social welfare this investment needs to be prioritized on regional level. The long run general equilibrium consequences of any voluntary trade are always beneficial. This is due to the fact that resources in the importing country can be reallocated to be better used in other sectors, and in the exporting country resources will be allocated to the electricity industry from less value creating sectors. It is very difficult to forecast the generation mix for the lifetime of a transmission investment. Also, the supply curve is dynamic in time, for example the gas, coal and emission allowance price fluctuations modify the supply curve continuously. Further, the merit order of power plants can change over time. It is important to note that, contrary to power plant profitability, interconnector profitability is not dependent on the absolute levels of market prices but on the price difference between two markets. The advantage of using real bids instead of synthetic supply curves is that they include the strategic behavior of companies. The criteria based on social welfare could be one of set of criteria for optimal expansion of regional power system.

An interconnector between two price zones with a price difference will allow generators in the low price zone to supply load in the high price zone. This will result in an increase of overall social welfare if the net increase in producer surplus, consumer surplus and congestion rent is higher than the investment costs. However, there can be important distributional effects. In the low price zone, part of the consumer surplus will be transferred to the producer surplus as the price increases. Equally, in the high price zone part of the producer surplus will be transferred to the consumer surplus, as the price decreases.
A merchant investor might decide to invest in an interconnector if the project yields a positive net present value. The appropriate discount rate will depend on the weighted average cost of capital (WACC) of the investor, possibly adjusted for the project specific level of risk. To determine the cash flows, the (estimated) costs of building and operating the inter-connector are compared to the (estimated) private benefits, i. e. either the difference between prices at either end of the interconnector multiplied by the flow (congestion rent) or a regulated usage tariff multiplied by the flow.
In general there are no economic incentives for investing in cross-border transmission capacity. The only situation where incentives exist is to build transmission capacity from a country with lower prices and excess capacity to a country with high prices short of generation capacities. However, also in this case the uncertainty for any investor is very high because there is no guarantee at all that this price difference will prevail.
A generation company or a big consumer would be a natural candidate for building merchant interconnectors. They could themselves benefit from the interconnector capacity for additional exports or imports. Even more important could be the influence on prices in the price zones which the interconnector is connecting. A generator would build export capacity to increase the price level in its own zone. Thus the logic of a generation company building a merchant line would be quite similar to the logic of a vertically integrated TSO building the line. The difference is in the treatment of congestion rents which in the case of a TSO are considered to be part of the regulated income but in the case of a merchant investor can generate non-regulated profits, depending on the exemption decision.
By splitting up a single bidding zone along structural grid congestions different prices will evolve in the split areas. Thus, higher electricity prices in the congested (generation deficit) bidding zones will give locational signals to generators to invest in this zone. As a consequence new generation capacities near the load will reduce load flows from other areas and reduce congestion.
While market coupling is an unequivocally good thing for cross-border trading efficiencies, it poses an additional challenge for merchant projects since the revenues for inter-connector owners will stem directly from the uncertain and volatile price differentials in the day-ahead auctions typically used to couple markets. Market coupling without accompanying hedging or long-term contracting options has a significant impact on attracting merchant investment

and financing, as well as covering costs. Merchant interconnectors with debt finance will need to be financed or operated as infrastructure investments with very conservative lender risk appetite, which is a requirement to be at the fully contracted end of the spectrum of earnings profiles in order to receive an investment-grade credit rating and associated debt terms. , transmits Serbia-energy.eu