

ENTSO-E Mid-Term Adequacy Forecast 2016 consultation

A EURELECTRIC response paper

September 2016

EURELECTRIC is the voice of the electricity industry in Europe.

We speak for more than 3,500 companies in power generation, distribution, and supply.

We Stand For:

Carbon-neutral electricity by 2050

We have committed to making Europe's electricity cleaner. To deliver, we need to make use of **all low-carbon technologies**: more renewables, but also clean coal and gas, and nuclear. Efficient electric technologies in **transport and buildings**, combined with the development of smart grids and a major push in **energy efficiency** play a key role in reducing fossil fuel consumption and making our electricity more sustainable.

Competitive electricity for our customers

We support well-functioning, distortion-free **energy and carbon markets** as the best way to produce electricity and reduce emissions cost-efficiently. Integrated EU-wide electricity and gas markets are also crucial to offer our customers the **full benefits of liberalisation**: they ensure the best use of generation resources, improve **security of supply**, allow full EU-wide competition, and increase **customer choice**.

Continent-wide electricity through a coherent European approach

Europe's energy and climate challenges can only be solved by **European – or even global – policies**, not incoherent national measures. Such policies should complement, not contradict each other: coherent and integrated approaches reduce costs. This will encourage **effective investment** to ensure a sustainable and reliable electricity supply for Europe's businesses and consumers.

EURELECTRIC. Electricity for Europe.

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KEY MESSAGES

-)] EURELECTRIC welcomes the methodological improvements brought by ENTSO-E in the Mid-Term Adequacy Forecast (MAF) 2016, in particular the introduction of a probabilistic assessment of adequacy in Europe and the pan-European coverage of the study, including Turkey. Suggestions for additional improvements in these regards are included in this response.
-)] Despite the positive developments, EURELECTRIC regrets that the current MAF does not include any parameter able to express the sensitivity linked to the demand (e.g. GDP, demography growth rates, energy efficiency gains, prosumer development) nor to the supply side (e.g. economic viability of existing assets, or development of RES capacity, including decentralised generation). It is therefore crucial to develop, in the future MAF editions, realistic high-level sensitivities on the aforementioned elements.
-)] In EURELECTRIC's view, adequacy assessments should mostly focus on defining the level of reliable/firm capacity that is needed in the mid to long-term to satisfy a predefined reliability standard and demand estimations. As a prerequisite, ENTSO-E should define a consistent methodology for the demand forecasts and the assumptions provided by national TSOs, which should also be used as a common framework for national or regional studies.
-)] Regarding the supply side, mothballed capacity has been considered as being available in the MAF timeframe by several national TSOs. This assumption is far too optimistic as there is a lot of uncertainty regarding future evolution of generation capacity decisions: the electricity system lacks signals for both short-term operation and longer term system adequacy and decarbonisation. Firm capacity is therefore not properly valued and this could accelerate unexpected decommissioning/mothballing of power plants. EURELECTRIC therefore proposes to run a sensitivity that takes explicitly into account the (probable) absence of the equivalent amount of reliable capacity.
-)] Capacity uncertainty on the supply side should be duly considered in the MAF. For this reason, it is crucial that ENTSO-E performs high-level economic sensitivity analyses to evaluate whether this expected capacity is likely to stay online during the MAF timeframe. To perform such sensitivities, we believe that the economic assessment should rather be based on a top-down approach looking at the economic position of 'groups' of power plants (e.g. technology, age, etc.) rather than bottom-up approach looking at individual power plants. Special attention should be paid to the definition and inclusion of worst case generation portfolio scenarios in adequacy assessments as well as to the assessment of their impact on the security of supply.
-)] To get a complementary view on economic viability of groups of power plants, TSOs could take into consideration reports from consultants or investment banks, market reports on clean spark or dark spreads. These elements could help ENTSO-E developing different scenarios for power plants' economic viability, and hence infer possible early decommissioning within MAF's time horizon.
-)] EURELECTRIC welcomes the organisations of stakeholders' workshops to help ENTSO-E improving the data collection process, modelling methodologies and assessment of the results, including the development of realistic sensitivities on the demand and supply side.

Consistency of the Mid-term Adequacy Forecast studies

The ENTSO-E Mid-term Adequacy Forecast (MAF) is a Pan-European assessment of the risks of security of supply and the need for flexibility over the next decade. The methodology used by ENTSO-E takes into account the transformation of the power system with increasing variable generation from renewable energy sources (RES).

1. From your perspective, how can one ensure the consistency between European, regional and national adequacy studies?

Consistency between European, regional and national adequacy studies should be ensured through aligned (1) input structure (incl. scenarios) and assumptions; (2) methodologies and parameters; and (3) metrics and granularity for conclusion/evaluation.

Without alignment on these three elements (input – processing – output), it is not possible to meaningfully compare/combine adequacy studies performed at different levels.

The objective is not necessarily to use the same numbers everywhere – as local variations, specificities and circumstances should be correctly reflected – but they should follow a similar structure so that variations/changes/evolutions can be easily detected, queried/challenged and changed/substantiated. The use of publicly available software (commercial /open source) would help ensuring the buy-in from all stakeholders regarding the processing aspect.

Furthermore, it is crucial to take into account import/export and cross-border capacity availability in a consistent manner, in particular for national adequacy studies. An adequacy assessment covering a larger geographical scope is more complete in this matter as it takes interdependency between neighbouring countries into account. EURELECTRIC therefore sees strong added value to develop European/regional adequacy studies to complete assessments made at national level. In addition, we therefore see an increasing role for Regional Security Coordinators to also cover security of supply and capacity adequacy issues to enhance consistency of adequacy assessments.

Last but not least, the time horizon and years investigation should also be aligned to enhance consistency and comparability among adequacy studies.

MAF methodological improvements

The MAF 2016 represents a number of achievements worth highlighting. These include:

1. The study involves the whole Pan-European perimeter including Turkey

The results have been benchmarked by calibration of four different analytical tools, which also account for the regional differences in power systems across Europe. This increases the consistency and robustness of the complex analytical results presented in the report,

2. and helps to improve the links between the MAF and regional/national adequacy studies.

Also noteworthy are a number of important technical developments that meant it was possible to adapt the analysis to the specific requirements of different regions within

3. Europe. These include:

- an advanced temperature-sensitive load model*
- harmonised probabilistic hydrological analysis with data sets for extended dry and*
- wet hydro conditions*
- forced outage rates (FOR) for thermal units as well as on HVDC links*

For more detail see chapter 1, MAF 2016.

- 1. Considering the above, what additional methodological improvements shall ENTSO-E consider for the future MAFs? Please justify why.**

Suggestions for methodological improvements

EURELECTRIC welcomes the methodological improvements brought by ENTSO-E in the MAF2016, in particular the introduction of a probabilistic assessment of adequacy in Europe and the pan-European coverage of the study, including Turkey.

The following improvements already suggested by ENTSO-E to enhance the robustness of the next MAF edition would be most welcome:

-Use the data of 35 climatic years instead of 14;

-Improve assumptions on Net Transfer Capacity (NTC): Regarding the current assumptions on NTC, we understand that for computational reasons, and because most adequacy criteria are defined at the national level, ENTSO-E chose to model every bidding zone as a single node. It should however be noted that, even with an unchanged infrastructure, the NTC values are often dependent on the actual demand/generation: for instance, NTC in Germany depends on the

amount of wind generated in Northern Germany). This may justify the fact of considering more conservative NTC values in the MAF, until finer granularity flow-based models are available.

-Model demand response: Market-based demand response can provide considerable support for matching the supply and demand in peak situations. Besides industrial and commercial users, domestic consumers are expected to react increasingly more to market prices thanks to smart metering and spot-based pricing. Batteries and electric cars could also provide for additional resources in the future. In the current MAF, demand response and distributed storage capacities are only implicitly modelled. When calibrating thermal sensitivity of load, ENTSO-E indeed already considers the demand response potential as valued (implicitly or explicitly) today, leading to a reduction of demand when prices are high (i.e. very low or very high temperatures depending on the countries). A more explicit modelling of demand response would be welcome in the next editions of the MAF to explore the economic potential that is unexplored today.

- Use flow-based models.

On top of those improvements already suggested by ENTSO-E, EURELECTRIC would have the following proposals:

- More transparency: in general, we believe that MAF2016 report does not provide sufficient transparency on the parameter values used to obtain the presented results. It is necessary that ENTSO-E provides full information on assumptions regarding generation portfolios, demand features, and cross-border exchange capabilities under each scenario. For example, the current dataset provides installed capacity by plant type but does not provide information about planned and forced outage rates, size of operational reserves, capacity factors and total generation (which makes crosschecking the results against the provided demand or other sources difficult to do). Similarly, a key sensitivity of MAF is based around operational reserves contributing to adequacy or not. The published dataset however, does not provide information about the size of reserves used for each country.

- Do not treat mothballed capacity as being available in the study years and consider it consistently for all countries: the MAF provided a guideline to TSOs for which all power plants that are currently mothballed were to be tagged as available for the MAF. However, this guideline does not seem to have been taken into account consistently by all TSOs. Based on the information in chapter 6.2.11 and 6.2.19, France and Italy treat mothballed capacity as available capacity, while other countries such as the Netherlands do not. This distorts the view on the future adequacy situation. We believe that mothballed capacity should not be treated as being available. Recent years have indeed shown that the current design of European energy markets does not properly value reliable and firm capacity. Several Member States have therefore introduced capacity mechanisms as an additional insurance to reduce the risk faced by capacity providers and reach their desired level of adequacy. In this context, the MAF assumption (all capacities have to be modelled as online for system adequacy assessment – even if currently mothballed) is far too optimistic, unless the capacity is selected in a capacity market covering the area (see Irish TSO remarks in the MAF about closures of capacities not successful in the capacity market auction). EURELECTRIC therefore proposes to run a sensitivity analysis that takes explicitly into account the possible absence of the equivalent amount of reliable capacity.

- Treat demand consistently: the demand data provided by individual TSOs is inconsistent. While some of the demand data corresponds to the base case growth (e.g. Greece), other countries use a more conservative (from an adequacy perspective, i.e. higher) growth rate (e.g. Italy) and others simply use a forecast created for one of their internal studies (e.g. UK). There is also a very

different approach to energy efficiency (e.g. Bulgaria: “Little to no energy efficiency measures were considered for the resulting forecasts” vs. Croatia: “Investments in energy efficiency are expected and that will slightly slow the growth of electricity consumption”) or electric vehicle penetration. **EURELECTRIC believes that ENTSO-E should define a consistent methodology for the demand forecasts and assumptions provided by national TSOs.** This would include, among others, an alignment on the macro-economic assumptions (e.g. coherent GDP or demography growth rates), on the energy efficiency gains, on the prosumer development, etc. across countries.

- **Addressing all adequacy issues:** assessing whether adequate flexibility exists in the system to cope with large and fast load variations, or excess renewable energy in summer, will probably become as important as LOLE (Loss of Load Expectation) estimates in the near future (including in summers with inflexible generation and renewable sometimes exceeding demand). For instance, the Belgian TSO has looked at the issue in its latest adequacy report, but the flexibility requirements discussed are mostly those of the grid and not those of providers: harmonising flexibility analysis methods is sorely needed. The study should therefore also estimate the system’s adequacy of flexibility requirements (i.e. ramp-up and ramp-down requirements).

- **Consider the development of decentralised generation:** properly modelling such development in the future requires the DSOs to provide more transparency and visibility on the (existing/expected) decentralized capacity connected to their grid, as well as the associated generation.

Modelling improvements:

a) **MAF 2016 uses four different simulation tools and uses the average value as a basis index for generation adequacy.** Providing a view on the distribution (e.g. values of standard deviation, p50, p95, etc.) will complete the understanding of the adequacy level. The use of proprietary simulation tools does not allow stakeholders to understand in details how the modelling has been performed (algorithm, parameters and their tuning, limitations, etc.).

b) **Hydro management should be better integrated in the analysis, as proper simulations of hydro stock management over the year are a must,** as pointed out by the Norwegian TSO in the Norway MAF comments. The models to be used (e.g. based on a SDDP approach) should be able to calculate water values over a hydrological season, at least for hydro-intensive countries (Nordics, France, etc.). In addition, sensitivities S2 and S6 in terms of hydro optimisation should be better explained.

c) **The weather scenarios used by ENTSO-E are too narrow:** few years of extreme weather in the recent past and climate change make older events (e.g. winter 1954) less relevant: according to Météo France “The [climate change] trend calculated on 1979-2005 period is 0.55 ° C/decade [in France]”. In that context even the larger scenario set used by the MAF is too narrow. It would be useful to adopt for the MAF a larger set of weather scenarios defined according to “current climate”, like, for instance the 200 scenarios developed recently for RTE that seem to cover all of Europe (see https://cpr.concerte.fr/sites/default/files/20160229_Sc%C3%A9narios%20climatiques_Meteo%20France.pdf)

d) **The report does not contain any information on how simultaneous scarcity situations are modelled:** the management of such events should be taken into account given its potential impact on the adequacy assessments of adjacent countries/zones.

e) **Exchanges with non-ENTSO-E countries should be ideally modelled as market-based deliveries or at least as being fully or partly able to cover deficit situations**, and not as pre-defined data series, in all cases where these deliveries can be expected to fully or partly cover deficit situations depending on market prices.

f) **The model should also consider an additional connection/link between variables**: indeed, during dry years, forced outages are likely to increase as it is not possible to cool down conventional power plants when rivers' level is too low.

g) **Results of the capacity adequacy situation are compared to a generic reliability standard (LOLE of 1 hour/year)**. We welcome this approach which allows comparing forecasts of security of supply in all Member States. However, many countries have a different national reliability standard, often less strict than 1 hour/year. We would welcome some explanation on why such strict reliability standard has been retained.

Most importantly, our biggest concern is that the current MAF does not include any parameter able to express the sensitivity linked to the demand (e.g. GDP, demography growth rates, energy efficiency gains, prosumer development) nor to the supply side (e.g. economic viability of existing assets, or development of RES capacity, including decentralised generation). It is therefore crucial to develop in the future MAF editions realistic high-level sensitivities to the aforementioned elements. As for the decommissioning of existing power plants due to economic reasons (and not only to the end of their technical lifetime), since a dispatch model including fuel prices and carbon is used, a sanity check of the results must be carried out. Comparing the gross margin of various units to representative annual fixed costs (e.g. as provided in other adequacy studies) could allow to validate (or not) the strong assumption that all mothballed units are able to stay economically available for security of supply. We provide more input on this point in the section of the consultation dedicated to "Economic viability of mid-term adequacy forecasts".

Justification of the suggestions above - what will these improvements bring?

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Consistent view on the commissioning/decommissioning/mothballing of power plants

Aside of the methodology, the adequacy outcomes are strongly influenced by the input data. In the case of ENTSO-E MAF, one data that the TSOs do not have full visibility on is the availability/decommissioning/ mothballing of the power plants for the next 5 to 10 years.

A European overview on anticipated decommissioning of power plants is needed to improve the quality of the data and accuracy of the adequacy assessments. Further rules at the EU level on obligations for reporting decommissioning/mothballing plans by owners of large (> 100 MW) and “system-relevant” generators on a rolling basis to the relevant TSOs can further help providing a Pan-European view on generation adequacy, expectations and input to ENTSO-E’s adequacy forecasts.

1. In this respect, how can you or which other stakeholders can help ENTSO-E (and its members) to get more reliable data on power plants availability/decommissioning/mothballing plants.

It is understandable that ENTSO-E does not have full visibility on availability/decommissioning/mothballing of the power plants for the next 5 to 10 years; neither do the generators have such view.

In our opinion, requesting only owners of large (>100 MW) power plants or “system-relevant” generators to report their decommissioning/mothballing plans would be of limited added value for the following reasons:

- **Data collected would be unreliable:** recent major market shifts are hard to anticipate properly: see the renewables expansion leading to wholesale prices collapsing below marginal cost, or the gas price decrease putting pressure on lignite operators, or the depressed price of carbon due to the excess of EU ETS allowances. Providing decommissioning/mothballing plans years in advance would therefore not make sense given that changing economic conditions and regulatory interventions make such data very likely open to variation and therefore unreliable.
- **Data collected would be incomplete:** the trend towards more and more decentralised generation (wind, solar, small scale CHP, etc.) in the future should be duly taken into account as these assets may increasingly contribute to security of supply. In general, the future developments for these technologies and the amount of installed capacity are also uncertain. ENTSO-E should therefore get from the DSOs all the relevant information on existing/expected decentralized capacity/generation connected to their distribution grids.
- **Data collected are commercially sensitive information:** in any case, such information is commercially sensitive and would therefore not easily be shared by market participants without strong guarantees on the confidentiality rules to be applied.

Instead, we would encourage TSOs and national regulatory authorities to closely follow future changes of generation capacity to have aligned national views on the capacity development. It is also in our understanding that estimations of decommissioning plants will be included in the national plans that Member States should submit to the European Commission as part of the Energy Union’s governance framework.

However, we are convinced of the necessity to properly include elements of capacity uncertainty on the supply side in adequacy studies. In particular, we believe that ENTSO-E performs high-level economic sensitivity analysis to evaluate whether this expected capacity is likely to stay online during the MAF timeframe. To perform such sensitivities, we believe that

the economic assessment should rather be based on a top-down approach looking at the economic position of ‘groups’ of power plants (e.g. technology, age, etc.) and based on assumptions linking the level of mothballing to economic viability rather than bottom-up approach looking at individual power plants. Such decisions may also be interdependent on other plants, so we believe it is not advisable to look at each plant individually. It is also sensible to double-check that each scenario is economically consistent with the “economic presence / survival” of the plants needed to ensure adequacy.

Economic viability of mid-term adequacy scenarios

The scenarios analysed in MAF 2016 for 2020 and 2025 are based on a best estimate of the evolution of the generation mix (thermal and renewable park) and transmission capacity as well as demand forecast of each country.

Within the principles set out by ENTSO-E for a common and consistent data collection, all TSOs have provided data considering to their best knowledge the evolution of their generation mix, in some cases including “economic viability” of the scenarios provided.

- 1. In order to present in the MAF a view on the economic viability of the generation portfolio (at the national level), the TSOs need to have a complete view of the economical/technical data & assumptions linked to these forecasts. What would you recommend to us in order to improve the quality of the data and assumptions mentioned above?**

In our view, adequacy assessment should mostly focus on defining the level of reliable/firm capacity that is needed to ensure security of supply in the mid to long-term. Given a predefined reliability standard and the demand forecasts, the TSOs should therefore conduct an assessment of how much reliable/firm capacity should be present in the system (including cross-border capacity availability) to satisfy a given level of security of supply in the mid to long-term and compare it to the expected capacity. Making this « intermediate step » explicit would improve the quality and usefulness of the MAF.

As an initial step, it is crucial to define a consistent methodology for demand forecasts in order to obtain a more accurate/rigorous/coherent view on the level of demand that will need to be met (e.g. see our earlier suggestions for methodological improvements). If possible, it would be very valuable to include sensitivities based on different reliability standards. This would allow a better understanding on how the desired level of adequacy influences the level of firm/reliable capacity needed.

This consistent methodology for the MAF should also provide a common framework for national and regional adequacy studies (e.g. a consistent methodology for the demand forecasts, assumptions for building the scenarios to be analysed, etc.). As the European adequacy study shall build on the national assessments according to Regulation 714/2009¹, there will be a clear consistency problem if such common framework is not in place.

After this assessment, in order to evaluate whether this firm/reliable capacity will be available in the system and avoid relying on “ghost” capacity, ENTSO-E should ultimately include in the next editions of the MAF high-level economic sensitivities based on different scenarios to evaluate whether this expected capacity is likely to stay online during the MAF timeframe.

This economic assessment should rather be based on the economic position of ‘groups’ of power plants (e.g. technology, age) and taking assumptions on a level of mothballing/decommissioning linked to economic viability; e.g. a top-down approach looking at aggregate availability/mothballing/decommissioning instead of a bottom-up approach looking at individual

¹ See Article 8.4 of Regulation 714/2009 – “The European generation adequacy outlook shall build on national generation adequacy outlooks prepared by each individual transmission system operator”

power plants. As a matter of fact, providing a view on the economic viability of a specific generation portfolio should be done by market participants themselves and not be the task of TSOs, as they are regulated entities.

Decommissioning is not only due to power plants reaching the end of their technical lifetime. It can also happen for economic reasons due to the lack of sufficient incomes coming from the market able to recover the fixed costs of power plants, on top of variable costs (i.e. low market prices or high costs). To define assumptions on the level of decommissioning, ENTSO-E could proceed as follows: based on assumptions on variable costs for each type of generation, the simulation done by ENTSO-E would show an expected number of running hours for each technology and each country. Following an assessment of the possibility for these power plants to cover their fixed costs, ENTSE could then assume that N% of generation units running less than M hours in average could decommission (N and M would have to be appropriately defined to provide a realistic figure).

Special attention should be paid to the definition and inclusion of worst case generation portfolio scenarios in generation adequacy assessment as well as to the assessment of their impact on the security of supply. In this sense, reintroducing in the next MAF editions a more “Conservative Scenario” (improved with an economic viability analysis) like in the last SO&AF would be most welcome.

In addition, it is important to keep in mind that decommissioning can also be caused by an increase of environmental requirements that imply additional investments (i.e. Industrial Emission Directive), technical issues (i.e. excessive maintenance costs in old plants) or even company or political decisions (i.e. nuclear public acceptance).

To get a complementary view of the economic viability of groups of power plants, TSOs could take into consideration reports from consultants or investment banks, market reports on clear sparks or dark spreads. These elements could provide useful estimates of power plants’ economic viability in each market and help ENTSO-E developing different scenarios for power plants’ economic viability, and hence infer possible early decommissioning within MAF’s time-horizon.

- 2. A solution may be to use two different sensitivity-scenarios for each time horizon as described below: i) one scenario linked to the current regulatory framework based on the energy only market, and ii) a second scenario linked to the future regulatory framework (for example reflecting expectations of national implementation of capacity mechanisms or any other market design instruments). What is your view about this possible solution?**

Objectivity and fact-based analyses are important to assess the future capacity adequacy situation, and the MAF currently fulfils these high-level criteria though some further improvements are needed.

The current results show the capacity adequacy situation without taking into account the implementation of future capacity mechanisms in Member States. On the one hand, this approach enables the MAF to serve as “justification” for certain Member States to implement a capacity mechanism because it shows the capacity adequacy risks they would otherwise

experience (e.g. in the UK and France) in the future. On the other hand, this approach does not accurately reflect the adequacy situation for 2025. The capacity mechanisms in place at that time horizon will trigger, if needed, some investments (new, repowering, maintenance) to ensure the targeted level of system adequacy and to solve the capacity adequacy issue.

Adding a scenario showing the 'planned policy' situation (e.g. taking into account decided and planned implementation of capacity mechanisms in certain Member States) could help identifying the effects of the capacity mechanisms in the Member States that are implementing them. The planned policy scenario should not assume capacity mechanisms in Member States which do not plan to implement these options or where the planning is still under discussion. However, it is worth mentioning that such approach can only shed additional light in the analysis if the economic viability is adequately taken into account in both scenarios, otherwise the existence or not of capacity mechanisms does not make a difference. The scenario is also highly dependent on (economic) assumptions surrounding capacity mechanisms, both in case of centralised or decentralized model.

To assess the economic viability of the MAF, as mentioned in our answer to the previous question, EURELECTRIC would rather advise developing sensitivity scenarios in order to take into account the uncertainties on the supply side within the MAF timeframe. Such scenarios should represent different levels of stress in the electricity systems which can be influenced by many factors (e.g. fuel prices, macroeconomic conditions, etc...) and not only by the evolution of the regulatory framework. Such sensitivity analysis would be more appropriate to allow market players and public authorities to appreciate the risk related to the absence of regulatory interventions (e.g. the introduction of capacity mechanisms, etc.) aimed at ensuring the evolution of the generation fleet necessary to meet the security of supply targets defined at national level.

Any other comments

1. Please tell us below if you have other suggestions.

Extreme cold or warm events can lead to losing far more generation capacity than the quantity predicted by usual models (because of reduced cooling source availability, frozen captors, etc.). While modelling these events is quite difficult and data intensive, they should be considered in the long term for inclusion in the MAF methodology.

Modelling requires good data: we are not sure that the current implementation of regulation 543/2013 on hydro reservoir contents reporting, as it is currently implemented, helps in this regards since the numbers published actually do not reflect the energy that can be produced through all dams down to the sea. Indeed, reservoirs energy is now reported based on local potential production when going through the local turbine, as opposed to the old UCTE assessment of energy available through all dams down to the sea: this means that the water equivalent of 1 GWh in one dam can turn into 1.5 GWh to 7 GWh of hydro production when released, depending on location.

EURELECTRIC pursues in all its activities the application of the following sustainable development values:

Economic Development

▶ Growth, added-value, efficiency

Environmental Leadership

▶ Commitment, innovation, pro-activeness

Social Responsibility

▶ Transparency, ethics, accountability



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