



National Action Plan for Smart Grids (NAP SG)

ABSTRACT



"National Action Plan for Smart Grids (NAP SG) ", which undergone interdepartmental comment procedure on December 23, 2014, is based on the analyses and documents elaborated in the years 2013-2014. The Government approved the NAP SG at its meeting on March 4, 2015. Full version of NAP SG in Czech is available on the website of the Ministry of Industry and Trade <http://www.mpo.cz/dokument156514.html>.

Link to the abstract in English: <http://www.mpo.cz/dokument158711.html>

Introduction

Communication from the Commission „Making the internal energy market work”, issued on November 15, 2012, states in the Annex the Action Plan for Europe. The Item 14 of the Annex calls for to “Prepare national action plans for swift deployment of smart grids”.

New proposal of the Actualisation of the State Energy Concept (ASEC) in chapter “SEC promotion instruments in public administration” also tasks Ministry of Industry and Trade to prepare a National action plan for implementation of Smart Grids till December 31, 2014.¹

This task is associated with one of the priorities of SEC – the concept of development of network infrastructure to ensure reliable and safe operation with respect to the required development of distributed generation (especially Renewable Energy Sources – RES), including the involvement of small combined heat and power (CHP) generation plants, production management, accumulation and consumption and taking into account the requirement of increasing of energy efficiency.

Ministry of Industry and Trade has prepared the "National Action Plan for Smart Grids (NAP SG)", based on the analyses elaborated in the years 2013-2014.

Smart grids (SG) are defined as the electric networks that are able to effectively link the behaviour and actions of all users connected to them - producers, consumers, prosumers (consumers with their own production) - to ensure the economically efficient, sustainable energy systems operating with low losses and high reliability of supply and safety.

NAP SG assumes a gradual introduction of smart grids and other measures in several stages. Investments in smart grid are also investments into the infrastructure and will be reflected in regulated components of electricity price. Therefore it is necessary to adapt the way and speed of the smart grid deployment to benefits for consumers.

The development of the legal environment is also important for effective use of smart grids, therefore NAP SG includes appropriate measures in this sense. NAP SG includes a comprehensive draft of the measures to ensure the preparation and implementation of necessary changes in cost optimised manner. Also the schedule of the implementation of the various measures is part of the NAP SG.

¹ Actualisation of the State Energy Concept was adopted by the Government on May 18, 2015, as the valid SEC.

Additional costs related to the implementation of SG will be financed through tariffs (payments of end customers who consume electricity) and through subsidies from Operational Program Enterprise and Innovation for Competitiveness, i.e. with no impact on public budgets.

Document Structure

The document has three main parts:

The chapter "Expected development of the energy sector," briefly describes the expected development of the energy sector of the Czech Republic for periods starting with the period until 2019, followed by two five-year periods until 2024, until 2029, and finally, the last between 2030 and 2040.

Description of the expected development in different periods includes the proposed structure of electricity sources, the situation in the heating sector, a volume of distributed electricity generation, which will be necessary to integrate, the expected development of technologies (e.g. the expansion of electromobility), other expected influences and activities needed in the electricity system, e.g. gradual introduction of advanced metering management (AMM).

New technologies and their implementation will induce additional costs on the part of network operators, which are always in each time period evaluated. Development and use of smart grids cannot be done without additional costs on the part of users of networks. Those costs are not quantified herein, because their range will depend on the behaviour and decisions of network users.

Chapter "Description of the environment and conditions for the target solution of SG in the Czech Republic" is based on extensive analytical data, which are in Annex No. 1 of the NAP SG. The chapter describes, among other things, several topics important to decide on further action in the electricity sector.

Safe and reliable electricity and heat supply, its availability and related environmental issues are essential requirements for the energy sector. In implementing these requirements, the smart grids will have a major role to play. SG target is to integrate the requirements, behaviour and activities of network users (customer, generator and trader) and other stakeholders to ensure efficient and durable, economical, safe and reliable supply of electricity.

Especially in connection with the development of renewable sources, the anticipated development of small sources, including combined heat and power production, the development of storage capacities and electromobility, increased demand on control systems, protection systems, measuring equipment, automation equipment and other elements of the power system is expected. Ongoing and planned development of energy-, information-, measuring- and communication technology offers a number of possible technical solutions for creating intelligent networks with different levels of quality and reliability of electricity supply in relation to economic demand. The proposed SG solution, implementation procedures and recommendations must satisfy the condition of technical feasibility, but also the economic eligibility.

An integral part of considerations on the integration of intelligent elements into electricity system of the Czech Republic is to ensure cyber security, privacy and information support provided to the client for his decision.

The gradual development of distributed generation (renewable and non-renewable sources) does not fully replace by its potential the existing production of conventional energy sources, neither in terms of contribution to the balance of the Czech Republic, the adequacy of power, nor in terms of operating characteristics. Given the situation in the Czech Republic, there is need to address in terms of time priority, secure and reliable supply of heat, especially in view of possible development of combined heat and power production, including the small- and micro. Ensuring a reliable supply of heat, there will be another reason for the development of smart grids in the Czech Republic and because of the potential to increase the volume of the controllable respectively impressible electricity consumption in the form heat produced from electricity.

Changes in legislation must respond adequately to changes in the functioning of the market, regulation and market model, including the tariff system in order to set up a non-discriminatory environment within the energy sector. That for example means that the price system and the financing of various contributions will not lead to an economically unjustified advantage to some market participants.

The sophisticated idea of the use of smart grids in electricity and services trade must be a part of the new electricity market rules and tariff systems. Network users will begin to use the benefits of the smart grids gradually, as soon as their network operators, OTE (Energy Market Operator) and companies providing energy services will offer them new opportunities.

Chapter "Implementation Plan of SG in the Czech Republic," sets the planned targets in SG itself, extended by the objectives relating to the integration of renewable energy sources and related legislative changes needed in these time periods.

The period up to 2019 can be characterized as a period of preparation (analysis, solutions to individual problems, partial measures, drafting and final approval of the Target Model SG). Following periods 2020-2024 and 2025-2029, represent the gradual implementation of the agreed model SG in order to achieve maximum economic efficiency at the required level of "intelligence" of the SG in the period between 2030 and 2040 in accordance with the needs of the energy system and the existing technological level at that time.

The steps described in the individual periods are divided for clarity into three groups: Technology, Legislation, Regulation and Market.

Chapter contains specific measures that are necessary to meet the objectives of the NAP SG, which are:

- to create a concept for the development of intelligent systems and elements in the energy sector of the Czech Republic,



They are presented in breakdown into "action" provisions, when it comes to work towards predetermined goals, and "supportive" provisions, mainly including various analyses and processing documents for further decision making etc.

Table 1 Action measures

| Provision No. | Provision o. | Responsible Institutions | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---------------|--|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A 1 | Licence for Accumulation | MIT | | | | | | | | | | | | | | | | | |
| A 2 | Ensuring legislative amendments to unambiguously distinguish the off-grid systems | MIT | | | | | | | | | | | | | | | | | |
| A 3 | Modification/change in tariff system | ERO | | | | | | | | | | | | | | | | | |
| A 4 | Measurement PoD/T with production following a simplified approach to the small sources | ERO | | | | | | | | | | | | | | | | | |
| A 5 | Setting gas tariffs | ERO | | | | | | | | | | | | | | | | | |
| A 6 | Solving energy poverty | MIT, ERO, | | | | | | | | | | | | | | | | | |
| A 7 | A set of measures to secure ancillary services and balancing power in ES CR | MIT | | | | | | | | | | | | | | | | | |
| A 8 | Dispatching control in the new SG environment | MIT | | | | | | | | | | | | | | | | | |
| A 9 | Proposal and adoption of measures for the integration of the high share of distributed generation into ES CR | MIT | | | | | | | | | | | | | | | | | |
| A 10 | Creation and implementation of the "ENTSO-E network codes " | MIT | | | | | | | | | | | | | | | | | |
| A 11 | Conditions of operation and development of the ES CR with distributed generation in an SG environment | MIT | | | | | | | | | | | | | | | | | |
| A 12 | DECE use, consumption, incl. elektromobility to control ES CR in SG environment | MIT | | | | | | | | | | | | | | | | | |
| A 13 | Equipment modification and calculations of investment demand in ES CR | MIT | | | | | | | | | | | | | | | | | |
| A 14 | Conformity assessment of equipment placed on the Czech market | MIT | | | | | | | | | | | | | | | | | |
| A 15 | Reverse effects of electricity generating plants and electricity appliances on ES CR | MIT | | | | | | | | | | | | | | | | | |
| A 16 | Q and power factor measurement for low-demand MOP | MIT/ERO | | | | | | | | | | | | | | | | | |
| A 17 | Measuring of supply and consumption of households and preparation for the AMM | MIT | | | | | | | | | | | | | | | | | |
| A 18 | Gauge AMM / AMR equipped with GPRS transmission | MIT | | | | | | | | | | | | | | | | | |
| A 19 | Cancellation of prior notice of changes in tariff switching times | ERO | | | | | | | | | | | | | | | | | |
| A 20 | Automated system of dispatching management (ASDŘ) and protection in ES CR | MIT | | | | | | | | | | | | | | | | | |
| A 21 | Safety of island operation | MIT | | | | | | | | | | | | | | | | | |
| A 22 | Data security and cybersecurity act | MIT | | | | | | | | | | | | | | | | | |
| A 23 | Physical security | MIT | | | | | | | | | | | | | | | | | |
| A 24 | Accumulation | MIT | | | | | | | | | | | | | | | | | |
| A 25 | Integration of electric vehicles into DS | MIT | | | | | | | | | | | | | | | | | |
| A 26 | Evaluating the effectiveness of the tariff system introduced on January 1, 2016 and increase of its dynamism | ERO, MIT | | | | | | | | | | | | | | | | | |
| A 27 | Implementation of a policy framework in the Climate and Energy Field 2030 | MIT | | | | | | | | | | | | | | | | | |



Table 2 Supporting measures

| Provision No. | Provision | Responsible Institutions | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---------------|--|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| P 1 | Monitor further development of selected EU documents | MIT | | | | | | | | | | | | | | | | | |
| P 2 | EEAG rules and their impact on energy sector in CR | MIT | | | | | | | | | | | | | | | | | |
| P 3 | Setting the payments for system services | ERO | | | | | | | | | | | | | | | | | |
| P 4 | Costs associated with the elimination of imbalances in case of increases in the management flexibility using the ripple control | ERO | | | | | | | | | | | | | | | | | |
| P 5 | Use of controlled consumption at the same time for the needs of DSO and the trader using a "traffic light" system | ERO | | | | | | | | | | | | | | | | | |
| P 6 | "Capacity markets" in the EU | MIT | | | | | | | | | | | | | | | | | |
| P 7 | Limits of cross-border flows | MIT | | | | | | | | | | | | | | | | | |
| P 8 | Analysis of the possibility of replacement of heat and electricity supply from existing coal power plants | MIT | | | | | | | | | | | | | | | | | |
| P 9 | Support for R&D in the field of integration of DECE and SG | MIT | | | | | | | | | | | | | | | | | |
| P 10 | Compensation of capacity in DS | MIT | | | | | | | | | | | | | | | | | |
| P 11 | Operational metering | MIT | | | | | | | | | | | | | | | | | |
| P 12 | The extent of the transmitted data on the consumption of continual meters, providing of these data to the customer, management of unbalanced consumption of electricity | MIT | | | | | | | | | | | | | | | | | |
| P 13 | Telecommunications network | MIT | | | | | | | | | | | | | | | | | |
| P 14 | Ensuring access to high-speed Internet | MIT | | | | | | | | | | | | | | | | | |
| P 15 | Shortening the business and the evaluation interval | MIT | | | | | | | | | | | | | | | | | |
| P 16 | Binding between NAP SG and strategy of the Czech Republic in the field of clean mobility, evaluating the effectiveness of the integration of electromobility into the electricity market | MIT | | | | | | | | | | | | | | | | | |
| P 17 | Analysis of the restructuring needs of ancillary services due to trends, and according to the development of SG | MIT | | | | | | | | | | | | | | | | | |

For each measure, the card of arrangements has been processed, in which a specified objective, description of the measures, responsibilities and deadlines has been specified.

Ministry of Industry and Trade (MIT) in cooperation with other state authorities, which have the responsibility for implementation of the NAP SG, will evaluate the progress of implementation (see terms in the cards of measures).

MIT will inform the Government as follows:

- MIT shall submit the results of the ongoing evaluation to the Government in the Report on the interim evaluation of the NAP SG latest on December 31, 2017.
- MIT shall submit the proposal for an updated plan for the implementation of the NAP SG to the Government latest on December 31, 2019.

Prague, June 9, 2015