

National Action Plan for Smart Grids (NAP SG)

Workshop with Taiwanese delegation
Ministry of Industry and Trade, Prague

04.09.2015

Martin Písecký

pisecky@mpo.cz



MINISTRY OF
INDUSTRY AND TRADE



Why National Action Plan?

- European Commission Communication „Making the internal energy market work“, issued on 15. November 2012 in Annex requires Member States of processing NAP SG
- The State Energy Concept of the Czech Republic (SEC) also formulates task for MIT: „To develop National Action Plan for the implementation of smart grids“

Why National Action Plan?

Previous two points form a political - legislative framework for a set of measures that ensure future reliable and efficient operation of the electricity system and meet also following objectives:

- Integrating the growing volume of electricity from intermittent sources and small decentralized sources connected to the distribution network
- The development of the electricity market and involvement of active consumers into the market through smart grid technologies

Why National Action Plan?

- Providing support for consumers to increase the efficiency of energy use
- Ensure technological support for modern concepts of smart cities, electromobility, accumulation ..
- Consequently to contribute (through intelligent technologies) to meet defined emission targets

National Action Plan - Development

- The National Action Plan is the elaboration of specific steps and measures to achieve these goals, both in the administrative and technical point of view.
- In the years 2013 - 2014 the analysis and preparation of documents carried out (expert team led by MIT)
- The three main areas - legislation, tariffs, technology

National Action Plan - Development

- Experience from the operation of the transmission system, distribution systems and pilot projects

- According to previous steps, at the end of 2014, National Action Plan for Smart Grids was elaborated

National Action Plan - Development

- Comment procedure has followed - internal in the MIT and interdepartmental (Ministries, professional associations etc.)
- Document was submitted to the Government after settlement of comments, approved March 4, 2015
- It becomes obligatory for public authorities

National Action Plan - Development

- In June, 2015 the **Coordination Committee for National Action Plan** was established
- **Chairman** – deputy minister for energy Mr. Pavel Šolc
- **Members** – top management of the TSO / DSOs, other important players in Czech energy sector, state administration.
- **Meetings** – at least 4 times per year
- **Main tasks** – monitoring and coordination of fulfilling of the National Action Plan, recommendations for corrective measures

What is included in the National Action Plan?

- It deals mainly with the electricity system
- It defines measures within a time horizon of years 2015 - 2020, with an outlook to 2040
- It presumes a gradual introduction of smart grids and other measures in several stages
- The way and speed of deployment of smart grids are tailored to benefits for consumers, so that the progress is cost-optimal and costs correspond with benefits

Smart Grids definition

- The electricity networks that can efficiently integrate the behaviour and actions of all users connected to it — generators, consumers and those that do both — in order to ensure an economically efficient, sustainable power system with low losses and high quality and security of supply and safety.

More detailed view on the content

- Expected development of the energy sector
(time cuts for the years 2019/2024/2029/2040)
- Environment and conditions for SG solutions in the Czech Republic
- An implementation plan of SG in the Czech Republic,
including List of measures
(time cuts for the years 2019/2024/2029/2040)
- Summary from the analytical data created by the working groups during the preparatory phase

Preconditions

By the year 2019:

- Balance surplus of electricity
- By 2016, introduction of a simplified connection of small power sources
- Central Registry of Intake point at OTE
- Market model is shaped by the EU energy-climate policy, network codes, measures addressing the lack of a stable production capacity
- The possibility of installing a smart meter at the customer request (for payment of additional costs)
- The issue of privacy protection of the transferred data is solved
- Installed capacity of distributed generation approx. 4800MW is not a problem for the system
- Completion and evaluation of pilot projects, ongoing evaluation of NAP SG 12/2017, updating of implementation plan SG 12/2019

Preconditions

By the year 2024:

- Balance surplus of electricity
- Deploying of smart meters within the regular change (new-old meter) has been started
- Installed capacity of distributed generation approx. 5700MW can still be solved by traditional means
- At the end of the period – development of accumulation of the electricity from intermittent sources
- Significant expansion of electromobility (in accordance with NAP CM)
- Providing information on commodity price using SG
- Development and renewal of DS - in line with the NAP SG: A new generation of protection, remote-controlled transformers and distance (section) switches and WAMS technology

Preconditions

By the year 2029:

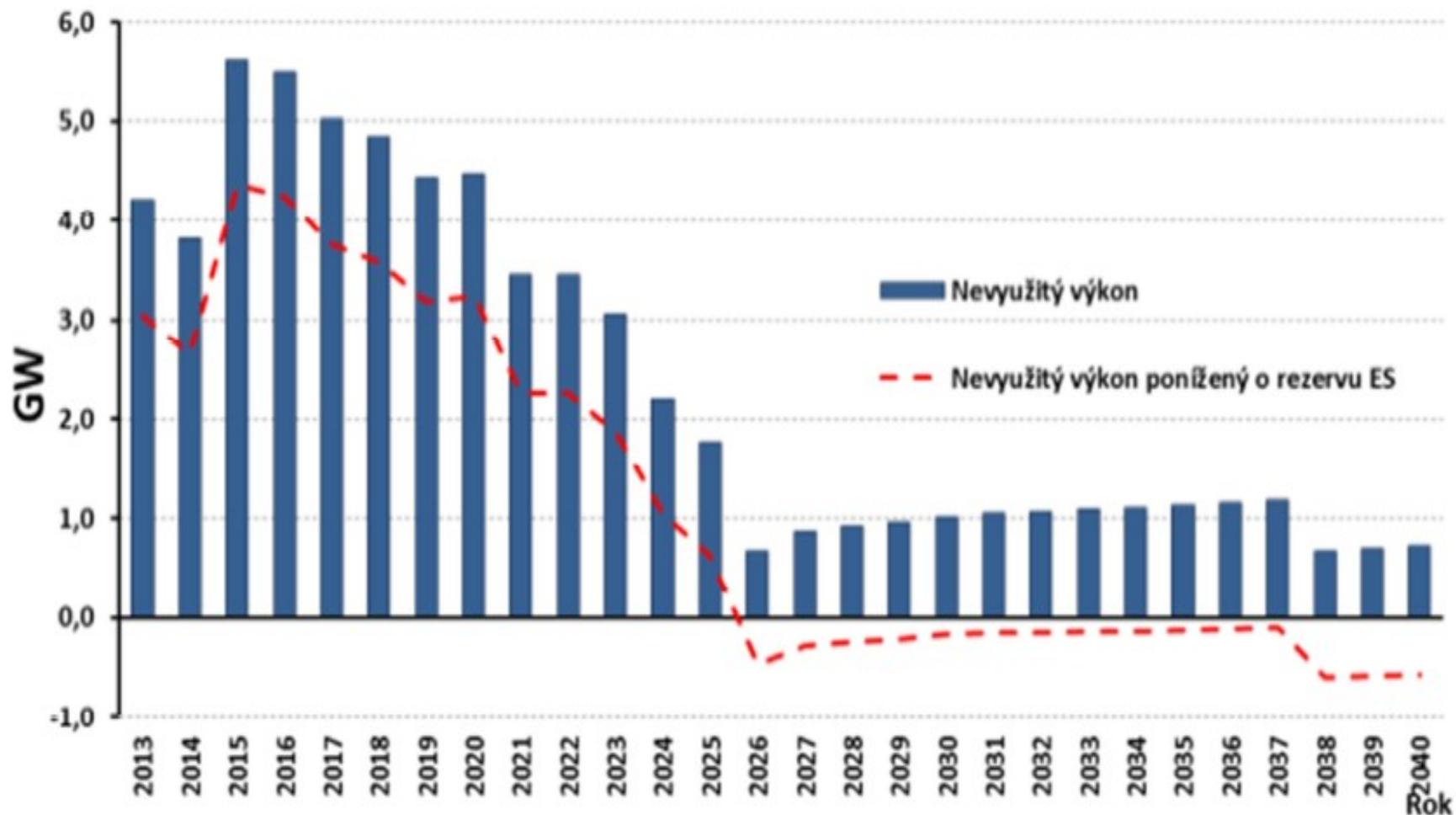
- Balance surplus of electricity may change at deficient, depending on the commissioning of new production capacities
- The global deployment of smart meters within the regular change (new – old meter) has been finished
- Installed capacity of distributed generation approx. 6600MW already requires higher "intelligence" of the network
- Cheaper RES technologies and accumulation and thus the possibility of their adoption into the market without subsidies and the creation of a new market segment
- Relatively developed electromobility (in accordance with NAP CM), hundreds of thousands of vehicles - charging power to hundreds of MW

Preconditions

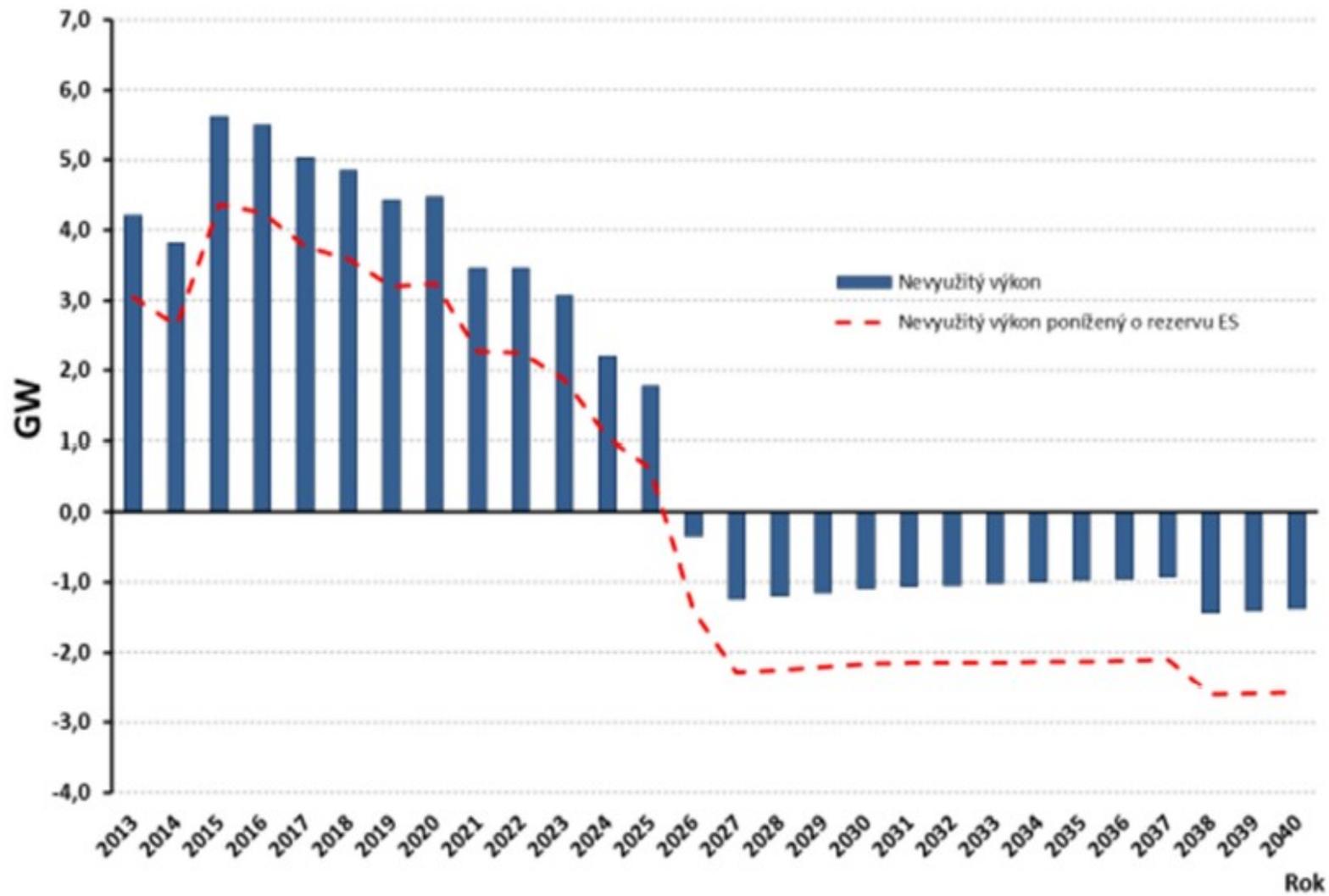
By the year 2040:

- Deficit balance may persist, moreover, due to the higher proportion of intermittent sources - problematic provision of classic Ancillary Services (AnS), need to use Demand Side Response (DSR)
- Finished global deployment of smart meters within the regular change (new – old meter)
- Installed capacity of distributed generation approx. 9700MW necessarily requires the use of SG in the DS and TS, integration of distributed generation and consumption in SG management
- Market model and the operation of the electricity system has been changed, the need for the automatic reactions to the generation from renewable energy sources - an indicator is the price on the spot market (dynamic tariff system)

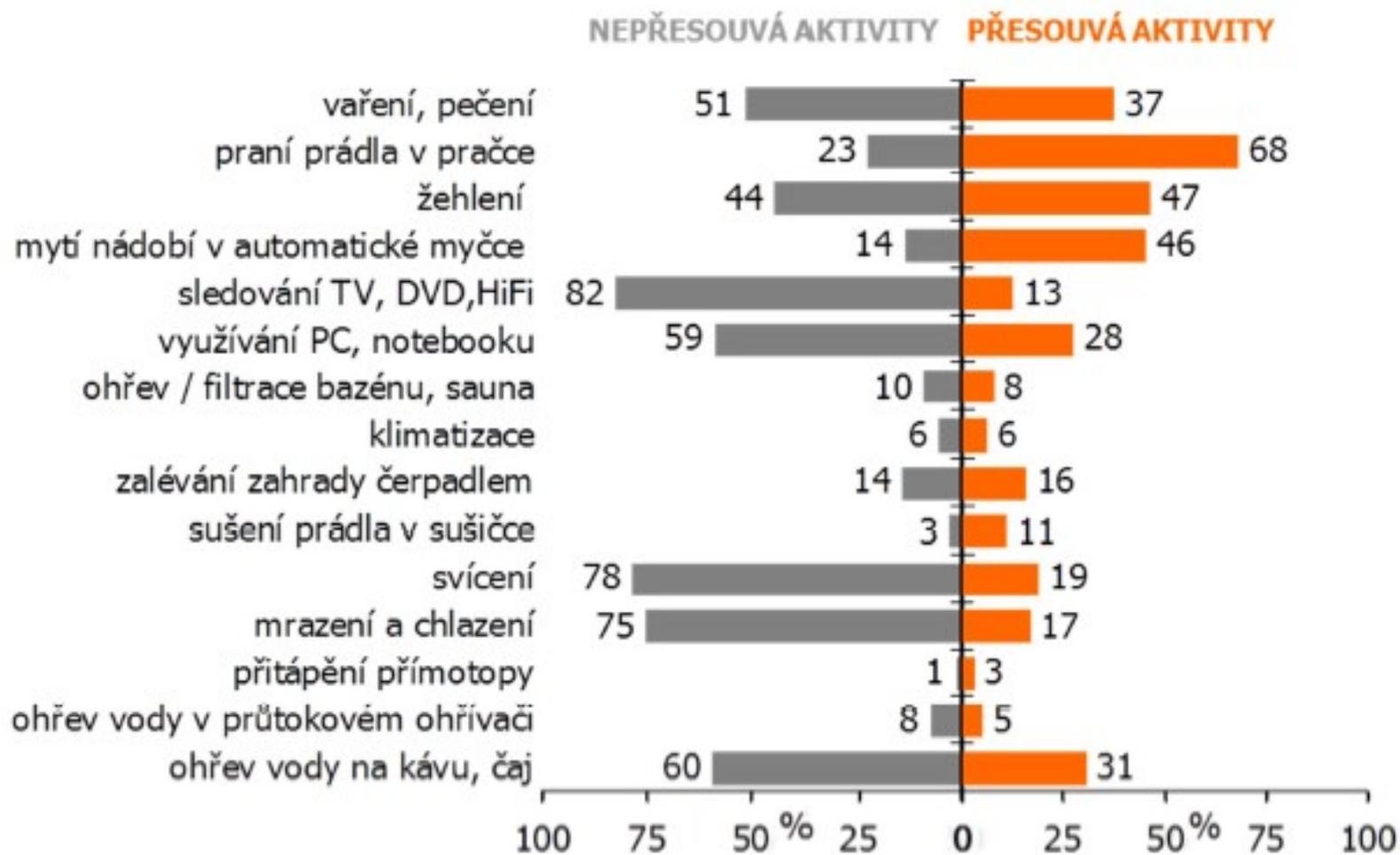
Balance with the operation of 2 Nuclear Power Plants



Balance with the operation of 1 Nuclear Power Plant



Example of DSR - willingness to move consumption



Preconditions

Costs:

- Within NAP SG, implementation costs have been divided into 4 groups:
 - development and renewal of networks for integrating distributed generation
 - ensuring the necessary network properties and automatic remote control system
 - electromobility
 - implementation of AMM
- Implementation costs are expressed as the additional costs beyond the common development and regeneration
- The estimated costs are 155 billion CZK in 2040
- Possible reduction of costs through optimization from the experience of partial implementation and from decreasing prices of technologies, resp. a suitable combination of common and "smart" technologies

Preconditions

Financing:

- The main part of the costs will be borne by regulated entities -> financing primarily through tariffs
- When implementing measures the possibility of EU funding will always be considered -> reduce the burden on customers
- Schedule, which is part of NAP SG, is a comprehensive proposal of measures to ensure the preparation and implementation of the necessary changes in a cost-optimal manner

Measures

Lists of measures are divided into two groups:

- **Action measures** - specific operational, technical and legal measures for implementation of SG in electricity network in the Czech Republic
- **Supporting measures** - analysis of the development, research and development, links to other related plans in the Czech Republic
- Each list contains measure, its description, responsible and cooperative entities and realization date

Table of measures

Číslo opatření	Opatření	Primární odpovědnost	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
A 1	Licence na akumulaci	MPO																	
A 2	Zajištění legislativních úprav pro jednoznačné odlišení off-grid systémů	MPO																	
A 3	Úprava/změna tarifního systému	ERÚ																	
A 4	Měření OPM s výrobou v návaznosti na zjednodušený přístup k malým zdrojům	ERÚ																	
A 5	Nastavení plynárenských tarifů	ERÚ																	
A 6	Řešení problematiky energetické chudoby	MPO, ERÚ, MPSV																	
A 7	Soubor opatření k zabezpečení podpůrných služeb a regulačních výkonů v ES ČR	MPO																	
A 8	Dispečerské řízení v novém prostředí SG	MPO																	
A 9	Návrh a přijetí opatření pro integraci vysokého podílu distribuované výroby do ES ČR	MPO																	
A 10	Tvorba a implementace „Síťových kodexů ENTSO-E“	MPO																	
A 11	Podmínky provozu a rozvoje ES ČR s distribuovanou výrobou v prostředí SG	MPO																	
A 12	Využití DECE, spotřeby vč. elektromobility pro řízení ES ČR v prostředí SG	MPO																	
A 13	Úpravy zařízení a výpočty investiční náročnosti v ES ČR	MPO																	
A 14	Posouzení shody zařízení uváděných na český trh	MPO																	
A 15	Zpětné vlivy výroben elektřiny a spotřebičů na ES ČR	MPO																	
A 16	Měření Q a účinník u MOP	MPO/ERU																	
A 17	Měření dodávky a odběru MOO a příprava pro AMM	MPO																	
A 18	Měřidlo AMM/AMR s GPRS přenosem	MPO																	
A 19	Zrušení předchozího oznámení změny časů přepínání tarifů	ERU																	
A 20	ASDŘ a chránění v ES ČR	MPO																	
A 21	Bezpečnost v ostrovních provozech	MPO																	
A 22	Informační bezpečnost a zákon o kybernetické bezpečnosti	MPO																	
A 23	Fyzická bezpečnost	MPO																	
A 24	Akumulace	MPO																	
A 25	Integrace elektromobilů do DS	MPO																	
A 26	Vyhodnocení efektivnosti tarifního systému zavedeného od 1. 1. 2016 a zvýšení jeho dynamičnosti	ERÚ, MPO																	
A 27	Implementace Rámce politiky v oblasti klimatu a energetiky do roku 2030	MPO																	

Sample of the List of measures

A 8 Dispečerské řízení v novém prostředí SG	
Cíl opatření	Navrhnout a postupně realizovat nový model dispečerského řízení odpovídající změnám ES ČR (např. integrace DECE) a plně využívající vlastnosti SG.
Popis opatření	<p>Očekávané změny způsobu provozování ES ČR dané zejména rozvojem DECE a požadavkem na zapojení DECE a spotřeby do řízení rovnováhy vyvolají bezpochyby potřebu úpravy procesu dispečerského řízení, redefinici rolí PPS a PDS v této oblasti a s tím související řešení HW a SW vybavení.</p> <p>V rámci tohoto opatření bude navržen koncept postupného zavedení bilancí uzlové oblasti 110 kV s využitím regulace toku v předacím místě mezi PS a DS ES ČR včetně využití bilancí uzlové oblasti 110 kV pro potřeby integrace decentrální výroby do distribučních sítí a ovlivňování dopadů vysokého rozvoje decentrální výroby na PS ČR.</p> <p>Podle současného programu rozvoje SG by zahájení realizace nového SG řešení dispečerského řízení mělo proběhnout v období 2020-24 (v tomto období by také mělo být zahájeno nasazování AMM). Přípravnou fází a vypracování finálního projektu je tedy potřeba provést v období do roku 2019.</p> <ul style="list-style-type: none"> • Dispečerské řízení a regulace distribuované výroby, akumulace a DSR v ES ČR s vysokým podílem distribuované výroby • Definice a využití vlastností SG pro potřeby dispečerského řízení • Role PPS a PDS • Bilancování uzlových oblastí • Požadavky na oblast telekomunikací, DŘS a ochrany dat • Požadavky na HW a SW vybavení • Využití Smart Grids pro potřeby řízení ES ČR • Potřebné legislativní úpravy
Odpovědnost	MPO
Spolupráce	PPS, PDS
Termín	2015 - 2016 návrh a schválení modelu a projektu řešení

Conclusion

- Given the long-term outlook for which action plan is processed, its continuous updating is assumed in the light of market developments, conditions of operation and technology.
- For a thorough introduction to the issue it is recommended to read also the analytical part
- **The entire document to download (in Czech only):**
<http://www.mpo.cz/dokument156514.html>
- **Abstract of the NAP SG (in English):**
<http://www.mpo.cz/dokument158711.html>

Thank you for your attention



MINISTRY OF
INDUSTRY AND TRADE

