

PROGRAM RAZVOJA PAMETNIH OMREŽIJ V SLOVENIJI

Igor PAPIČ

POVZETEK

Koncept pametnih omrežij pomeni nadgradnjo današnjega koncepta obratovanja in načrtovanja elektroenergetskega sistema ter v učinkovito celoto vključuje posamezne elemente sistema, tako klasične (centralizirane velike proizvodne enote, prenosno in distribucijsko omrežje) kot nove elemente, kot so na primer razpršeni proizvodni viri, napredni sistemi merjenja, odjemalci z možnostjo prilagajanja porabe, virtualne elektrarne, električni avtomobili in hranilniki električne energije.

Pametna omrežja so izjemno kompleksno in široko področje, uspeh pa lahko zagotovi samo usklajeno in celovito delovanje na vseh področjih. V programu razvoja pametnih omrežij se osredotočamo na desetletno obdobje do leta 2020. V tem času je cilj postopoma uvesti tehnologije, ki so danes že razvite. Na trgu obstajajo rešitve, kar manjka, pa so koncepti, kako te rešitve optimalno vključiti in izrabiti za potrebe omrežja. Namen programa je predvsem vpeljava obstoječih tehnologij v prakso in njihova optimalna izraba. Program ponuja natančno strukturo potrebnih nalog, raziskav, aktivnosti in masovnih implementacij, s katerimi po letu 2020 dobimo delujoč učinkovit koncept pametnih omrežij.

Skupno ocenjujemo, da bi bilo za izvedbo zadanih ciljev potrebno do leta 2020 v pametna omrežja investirati okrog 320 milijonov €. Vlaganja v raziskave so najbolj intenzivna v prvih 3 letih, ko se pripravlja na izvedbo konkretnih demonstracijskih projektov. V letih 2014 in 2015 je največja koncentracija demonstracijskih projektov, medtem ko so vlaganja v masovne implementacije največja v obdobju od 2015 do 2019, ko se izvaja naložba v napredno merjenje. Skoraj 90 % vseh stroškov bo namenjeno izvedbenim projektom. Do leta 2030 je z aktualnimi koncepti predvideno za 4,2 milijarde € investicij v distribucijsko omrežje. Če bi uvedli pametna omrežja, ocenjujemo, da bi lahko to vrednost v tem obdobju znižali za slabih 500 milijonov €.

S pametnimi omrežji Slovenija veliko pridobi – brez njih ne bo mogoče izpolniti okoljskih zavez, brez njih bodo potrebna vlaganja v omrežje višja. V Sloveniji imamo v segmentu pametnih omrežij zelo močno industrijo, ki nujno potrebuje poligone za preizkušanje svojih rešitev v realnem omrežju. Pametna omrežja so med najhitreje rastočimi globalnimi trgi. Med večjimi podjetji v Sloveniji na področju pametnih omrežij svojo priložnost vidijo Kolektor Group, Iskra MIS, Iskraemeco, Iskratel, Gorenje. Pametna omrežja s svojo kompleksnostjo in inovativnostjo ponujajo tržne niše tudi za številna majhna in inovativna podjetja. Veliko jih je

v Sloveniji že danes, prostor pa se odpira tudi za nove. Prav mala in srednja podjetja so v evropskih državah danes gonilo razvoja gospodarstva.

Za konec še nekaj dejstev, ki se jih pogosto napačno razlaga:

- *vlaganja v primarno opremo (daljnovodi, transformatorji) bodo še vedno potrebna – pametna omrežja omogočajo zgolj boljšo izkoriščenost te opreme;*
- *novi elementi (obnovljivi viri, električni avtomobili, ...) povzročajo potrebe po dodatnih vlaganjih v omrežje – razvoj in vzdrževanje omrežja se draži (vsak kW obnovljivih virov pomeni v povprečju 450 € dodatne investicije v omrežje).*

NASLOV AVTORJA

Igor PAPIČ, Univerza v Ljubljani, Fakulteta za elektrotehniko

DEVELOPMENT PROGRAM FOR SMARTGRIDS IN SLOVENIA

Igor PAPIČ

The concept of Smart Grids builds upon the modern concept of operation and power system planning. By joining classical (large centralized generation units, a transmission and distribution network) and new elements (distributed generation, advanced metering infrastructure, demand side management, virtual power plants, electric vehicles and energy storage systems), SmartGrids creates an effective system.

The success of SmartGrids – an extremely complex and broad area – requires coordinated and comprehensive action in all fields. The development of SmartGrids in Slovenia focuses on a ten-year period until 2020. Our objective for this period is to actually introduce technologies that have already been developed. Markets offer technical solutions but we lack concepts for their optimal application and integration into existing networks. The aim of this program is to introduce the existing technologies in practice, and, to this end, it provides an elaborate structure of the necessary tasks, research, operations and mass implementation, which will in turn deliver an effective operational concept of SmartGrids by 2020.

According to our estimates, around €320 million will have to be invested in SmartGrids by 2020 in order to attain the program's objectives. Investment in research is most intensive in the first three years when we have to prepare for the implementation of specific demonstration projects. Between 2014 and 2015, the emphasis is placed on demonstration projects, while investment in mass implementation peaks in the period from 2015 to 2019, when an investment in advanced metering infrastructure is foreseen. Nearly 90% of the total cost will be devoted to the mass implementation projects. The current plans foresee an investment of €4.2 billion in the distribution network by 2030 but if we introduce SmartGrids this amount can be reduced by €500 million for the same period.

SmartGrids will enable Slovenia to meet its environmental commitments and at the same time reduce the required investment in the network. Slovenia has a very strong industry in the segment of SmartGrids that is in urgent need of a testing ground for its solutions in a real network. Furthermore, SmartGrids are among the fastest growing global markets. Many large companies in Slovenia that are active in the area of SmartGrids, such as Kolektor Group, Iskra MIS, Iskraemeco, Iskratel and Gorenje, consider SmartGrids to be an excellent business opportunity. Since SmartGrids are complex and highly innovative, they are also a niche market for numerous small and innovation driven companies. There are many such potential businesses in Slovenia and there is room for many more. SMEs are the vehicle of economic development and growth in European countries.

To conclude, a few facts that are often misinterpreted:

- *investment in the primary equipment (lines, transformers) will still be needed - SmartGrids allow only for better utilization of these equipment;*
- *new elements (renewables, electric vehicles, ...) required additional investment in the network – network development and maintenance is becoming more expensive (each kW of renewables means on average €450 additional investment in the network).*

AUTHORS ADDRESS

Igor PAPIČ, University of Ljubljana, Faculty of Electrical Engineering,