



JEDLIK ÁNYOS KLASZTER

ELEKTROMOBILITÁS
MAGYARORSZÁGON

AN E-MOBILITY STRATEGY FOR HUNGARY: Results, Challenges and Opportunities

Lower Austria E-Mobility Workshop

Zoltán Vígh
May 25, 2018

CONVERGENCE OF THE COMMON EUROPEAN STRATEGIES:

1. Decarbonisation of the energy systems:

- *Security of the energy supply*
- *Clean energy, clean vehicles*
- *Renewable energies*
- *Alternative fuels: why electricity?*

2. Industry 4.0:

- *Energy Efficiency*
- *Competitiveness*
- *Innovation*
- *Digitalization*



Definitions are still problematic...

- Using electric powertrain technologies, in-vehicle information, and communication technologies and connected energy and ICT infrastructures to enable efficient and clean transport.
- Motivated by the need to address industrial fuel efficiency and emission requirements, as well as market demands for lower operational costs.
- **Hungarian version 2015:** A connected mobility network of different electric vehicles systems, that is based on efficient power supply and charging infrastructure on the one hand, and on right legal environment and incentives.





EU Legal Acts:

2009:

Directive 2009/28/EC on the renewable energies
Directive 2009/33/EC on the clean, energy efficient vehicles (FCEV)

2010:

"20-20-20" strategy: 10 % share of renewable energy in transport fuels

2011:

European Commission White Paper on Transport: no fossil fuel in city logistics after 2030

2014:

AIF directive 2014/94/EU on the infrastructure of alternative fuels, including electricity and hydrogen

2016:

Low Emission Mobility Strategy
"Winter Package" – Clean Energy for all Europeans

2017-2018:

"Europe on the Move" strategies: May 2017, Nov 2017, May 2018
"Clean Mobility Package" 2017

- **Deadline for Member State AIF strategies: November 18, 2016**
- **Final EU strategy: 2020 (by then min. 10% alternative fuel)**

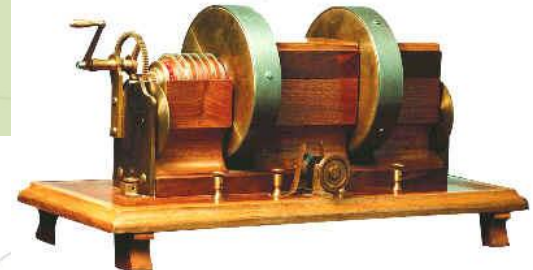
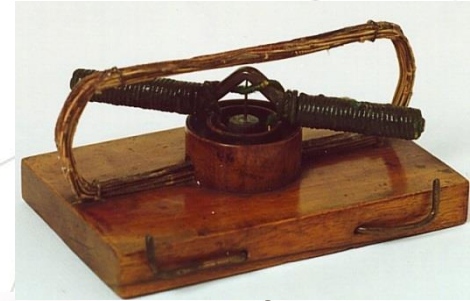
Back to the Austro-Hungarian Monarchy...



*Ányos Jedlik (1800-1895),
inventor of*

- *An electric motor 1827*
- *An electric car model 1851*
- *The Dynamo principle 1862*

Ányos Jedlik is associated with the science of electromechanics in the 19th century Europe.



BETWEEN THE TWO WORLD WARS...



The Royal Hungarian Post started using Hungarian-made RÁBA electric delivery trucks in Budapest in 1927...

...the futuristic vehicles were finally scrapped in 1966!



The government specified some focus areas for the development of e-mobility

R+D+I, support for the domestic industry

Infrastructure development (chargers)

System of incentives

Legal environment, codification

Public transport and smart, intelligent mobility

Demonstrations and pilot projects



THE „ÁNYOS JEDLIK PLAN: FINANCIAL AND NON-FINANCIAL INCENTIVES

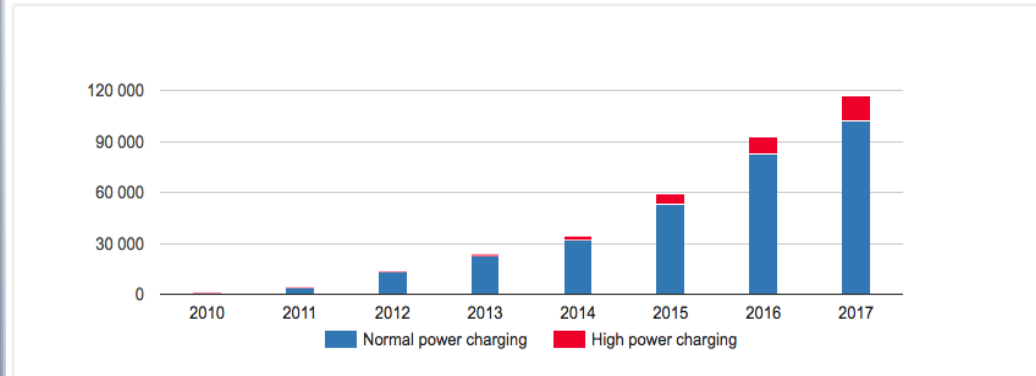


- Free parking in 34 cities;
- No registration tax;
- No company car tax;
- Green number plate for „environmentally friendly” vehicles;
- State subsidy to buy new new EVs (21% off the original price);
- State subsidy for municipalities to deploy chargers;
- Obligatory deployment of charging points in commercial outlets and parking lots (problematic).

STATE OF PLAY IN THE HUNGARIAN E-MOBILITY MARKET:

- Growing number of EVs (cc. 6.000 EVs - 2000 % growth since January 2016!)
- Lagging infrastructure (cc. 200 normal power AC chargers, 66 high power DC chargers at registered locations)
- Legal uncertainties: issue of "publicly accessible" chargers

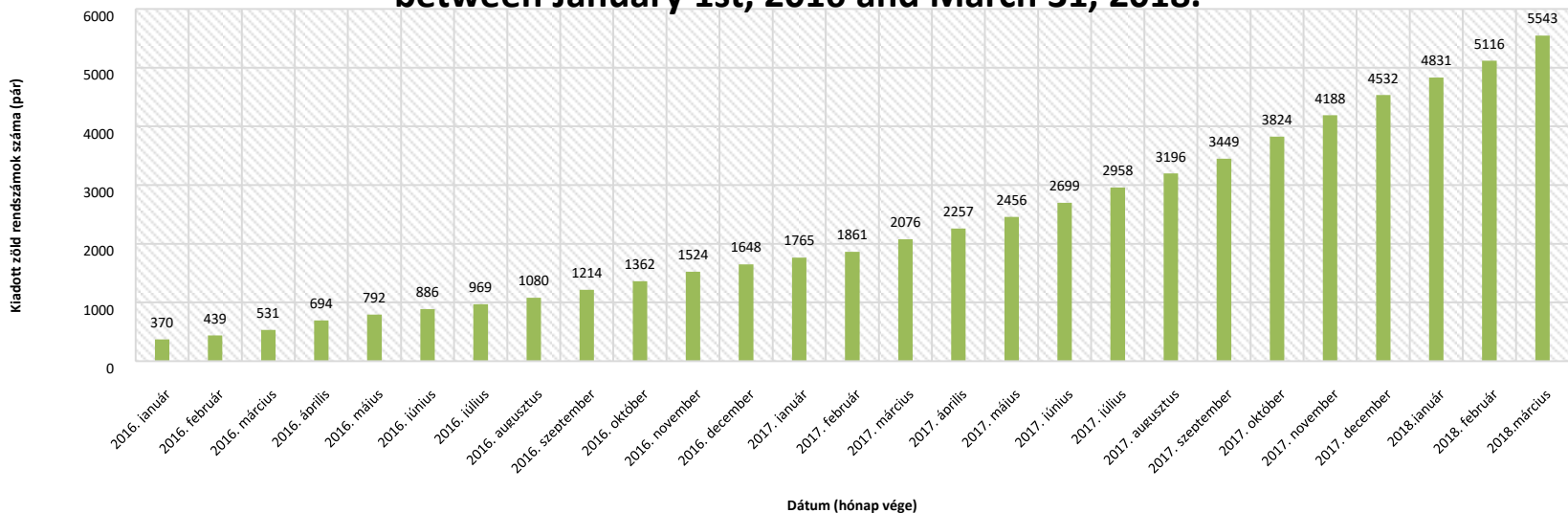
 Number of publicly accessible charging positions



Source: European Alternative Fuels Observatory

2013 - 60 AC, 3 DC
 2014 - 120 AC, 3 DC
 2015 - 158 AC, 22 DC
 2016 - 163 AC, 42 DC
 2017 - 206 AC, 66 DC
 2018 - 500 AC, 120 DC

The number of vehicles registered with green number plates in Hungary between January 1st, 2016 and March 31, 2018.



Expected EV stock in Hungary between 2017 and 2030

Source: e-Mobi Hungary

*Elektromos gépjárművek darabszámának
várható alakulása Magyarországon 2017-2030*



VEHICLES: THE COMPETITIVE EDGE OF THE HUNGARIAN AUTOMOTIVE INDUSTRY

10 % OF THE GDP, 175.000 EMPLOYEES

- **Integrating EVs into the product portfolio of OEMs: Audi, Mercedes, Opel, Suzuki, Bosch, Continental, etc.**
- **Three battery factories: Samsung**
- **Bus manufacturing factory: BYD**
- **Greater cooperation along the value chain**
- **Greater added value from local suppliers**
- **Innovation directions: automated, connected**
- **Reevaluation of core business activities and processes: LEV, air, maritime**
- **Threat: EVs need less parts**

THE HUNGARIAN E-MOBILITY INDUSTRY



ENERGY: TRANSFORMATION OF HUNGARY'S ENERGY SYSTEM ALONG THE ENERGY UNION LINES

2.7 % OF THE GDP

- **Decarbonization**
- **Integration of renewable energy**
- **Decentralized electricity production – prosumers**
- **Single electricity market – sufficient fuel supply**
- **Nuclear power stations and hydrogen economy**
- **Intelligent networks**
- **New balancing supply and demand**

Euroelectric: on the basis of the TCO the operation of BEVs and PHEVs is more cost effective than that of the cars with ICE.

THE HUNGARIAN E-MOBILITY INDUSTRY



**INFOCOMMUNICATION TECHNOLOGY IS GETTING
VITAL.**

13.7% OF THE GDP, 162,000 EMPLOYEES

- **5G networks - connectivity**
- **State-of-the-art Automotive Test Facility**
- **Self-driving research platform**
- **Sensors, cameras, data management**
- **Smart charging infrastructure**
- **International cooperation**

In the focus of R+D we can see a network of system-level innovation activities instead of single technological challenges.

THE HUNGARIAN E-MOBILITY INDUSTRY

Amber One – concept electric sports car designed by a team of Hungarian researchers





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Thank you for your attention!

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