ENERGY REGULATORS
REGIONAL ASSOCIATION

ERRA Internal Survey Results
E-mobility: Current Status, Plans and Related Regulatory Issues

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ERRA Joint Licensing/Competition and Tariff/Pricing Committees Meeting
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Background Information

- In 2016 the ERRA survey collected information from ERRA members – among other innovative issues – on the e-mobility as well.
- In the countries of those 14 ERRA members who participated in the survey the energy markets were at a different stage of development and their regulatory systems represented a wide range of support regime for smart technologies and new innovative operation modes.

The evaluation of the e-mobility related survey results in 2016 could be summarized as following;

- The regulatory authorities were interested in different aspects of e-mobility (electric vehicles [EV] and their charging infrastructure). Seven regulators marked their interest in the issue of allocating the EV related responsibilities among potential players (DSO, TSO, supplier, free market player). Five of the NRAs mentioned their interest in the necessary legal/regulatory framework supporting the deployment of EVs, while four of them were interested in special tariff elements of the e-mobility system.

Background Information - 2

- Some (limited) countries reported on the purchase subsidy of electric cars.
- There was some information regarding the implementation schedule of electrical car charging stations (systems). Among the responses the Estonian regulator reported the highest number of charging stations in operation at the end of 2015 (176 stations in operation).
- None of the respondents reported on the existence of legal/regulatory framework, which is allocating the e-mobility related responsibilities (construction and operation of charging system, data management, scheduling of charging/discharging cycle of car batteries for system operation purposes, billing) among potential players (DSO, TSO, supplier, free market player).
- Only the Estonian Regulator reported on implemented special tariff elements for the e-mobility system.

Background Information - 3

- During the last 4 years there have been substantial changes in several countries. The number of EVs and the charging points increased remarkably in several countries.
- There has been already established legal/regulatory frameworks in operation and ambitious plans for the construction schedule of electric charging points in many ERRA member countries.
- Based on this, in 2020 ERRA took a quick snapshot on the status of E-mobility in ERRA member countries and identify the related key regulatory issues.
- The survey assisted us to describing the national situation, to understand general tendencies and potential interest of ERRA members.

List of countries from where the ERRA Licensing/Competition Committee members involved in the development of the Survey

Armenia (RA)

Bhutan (BU)

Bosnia and Herzegovina (BH*)

Czech Republic (CZ)

Estonia (EE)

Georgia (GE)

Hungary (HU)

Latvia (LV)

Oman (OM)

Serbia (RS)

Slovakia (SK)

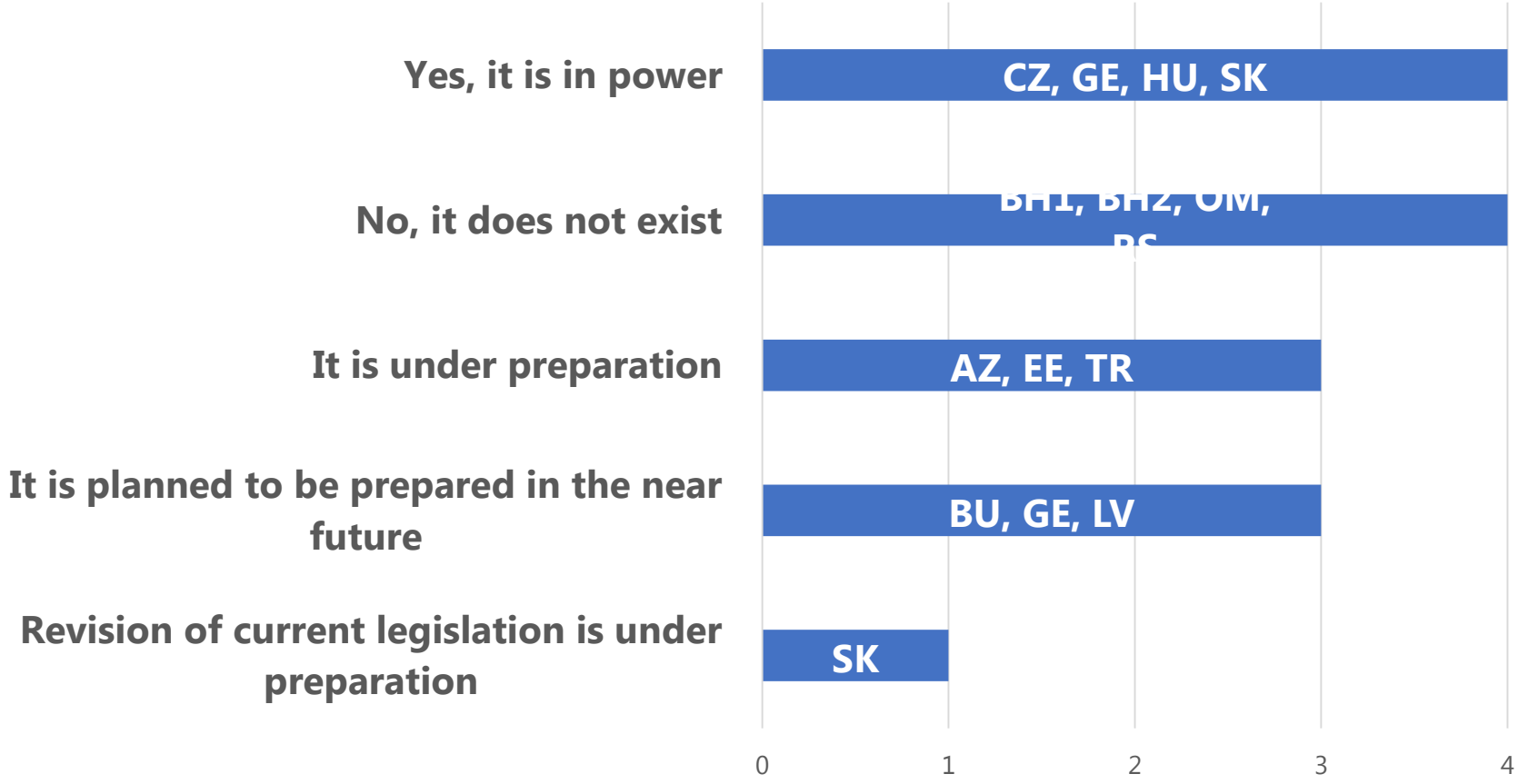
Turkey (TR)

Azerbaijan (AZ)

**State Electricity Regulatory Commission (SERC): BH1*
Regulatory Commission for Energy in Federation of Bosnia and Herzegovina (FERK): BH2

1. Legal/Regulatory Framework of E-mobility

1.1. Is the legal framework regulating the e-mobility related issues in power in your country?



1.1. Conclusion and Recommendation (EV legal framework)

Close to three fourths of the participating NRAs reported positive tendencies of legal/regulatory framework development regarding e-mobility. As much as 69% of the answers showed that the legal framework regulating e-mobility related issues is already in force, under preparation / under revision, or is planned to be prepared in the near future. Three countries reported a lack of legal settlements without mentioning plans on preparation.

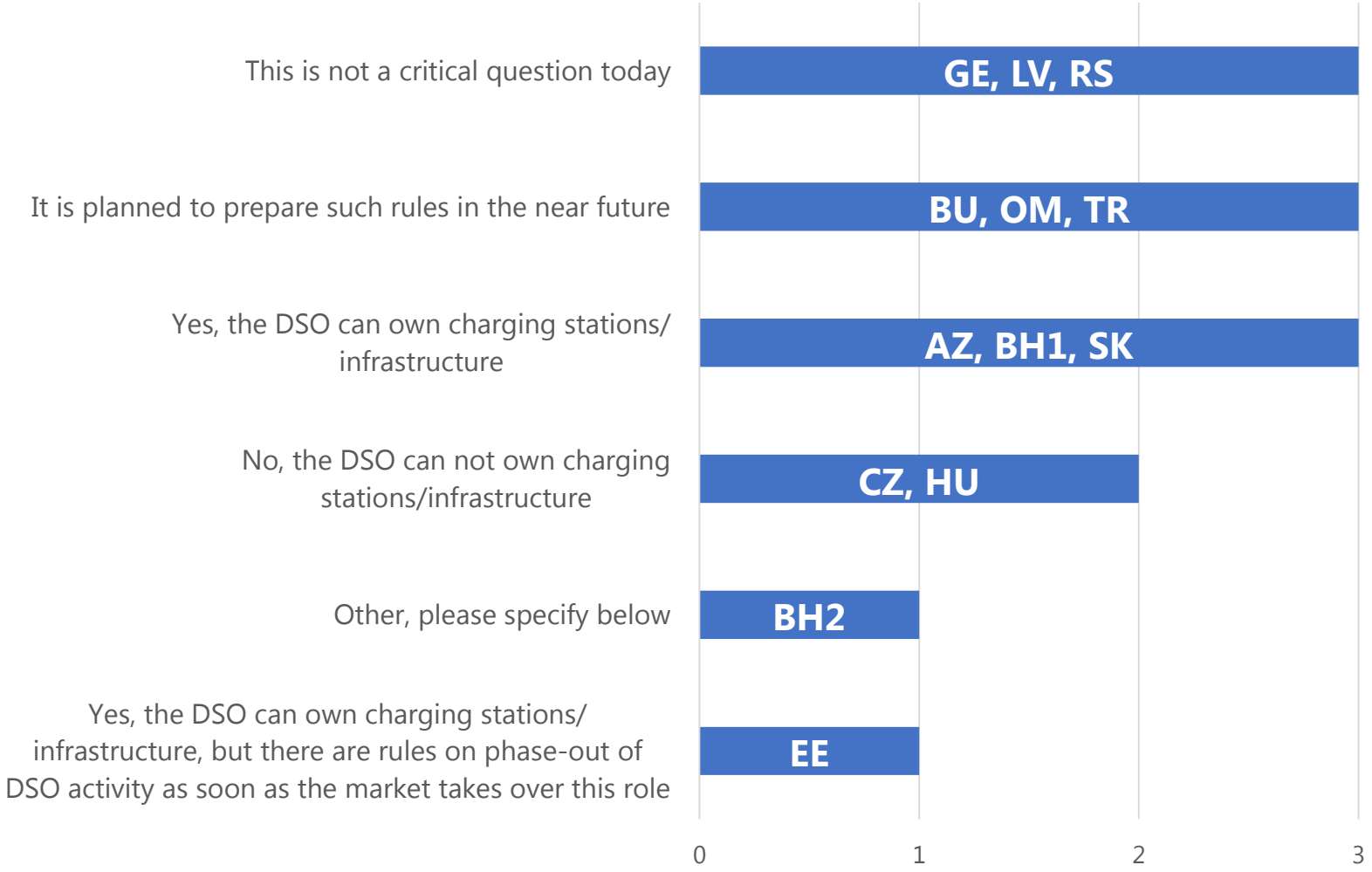
The general legal framework of e-mobility issues could help the popularization and expansion of charging infrastructure and EVs.

The Directives of the European Union are and will be a good orientation for those, who are planning the preparation of legal/regulatory framework for e-mobility related issues.

The detailed provisions should be delivered in the secondary regulation after certain level of spreading of EVs and charging infrastructure.

1. Legal/Regulatory Framework of E-mobility

1.2. Does the market model (set by the legal/regulatory framework) allow or disallow utility (DSO) ownership of charging stations/infrastructure?



1.2. Conclusion and Recommendation (DSO responsibilities re. charging infrastructure)

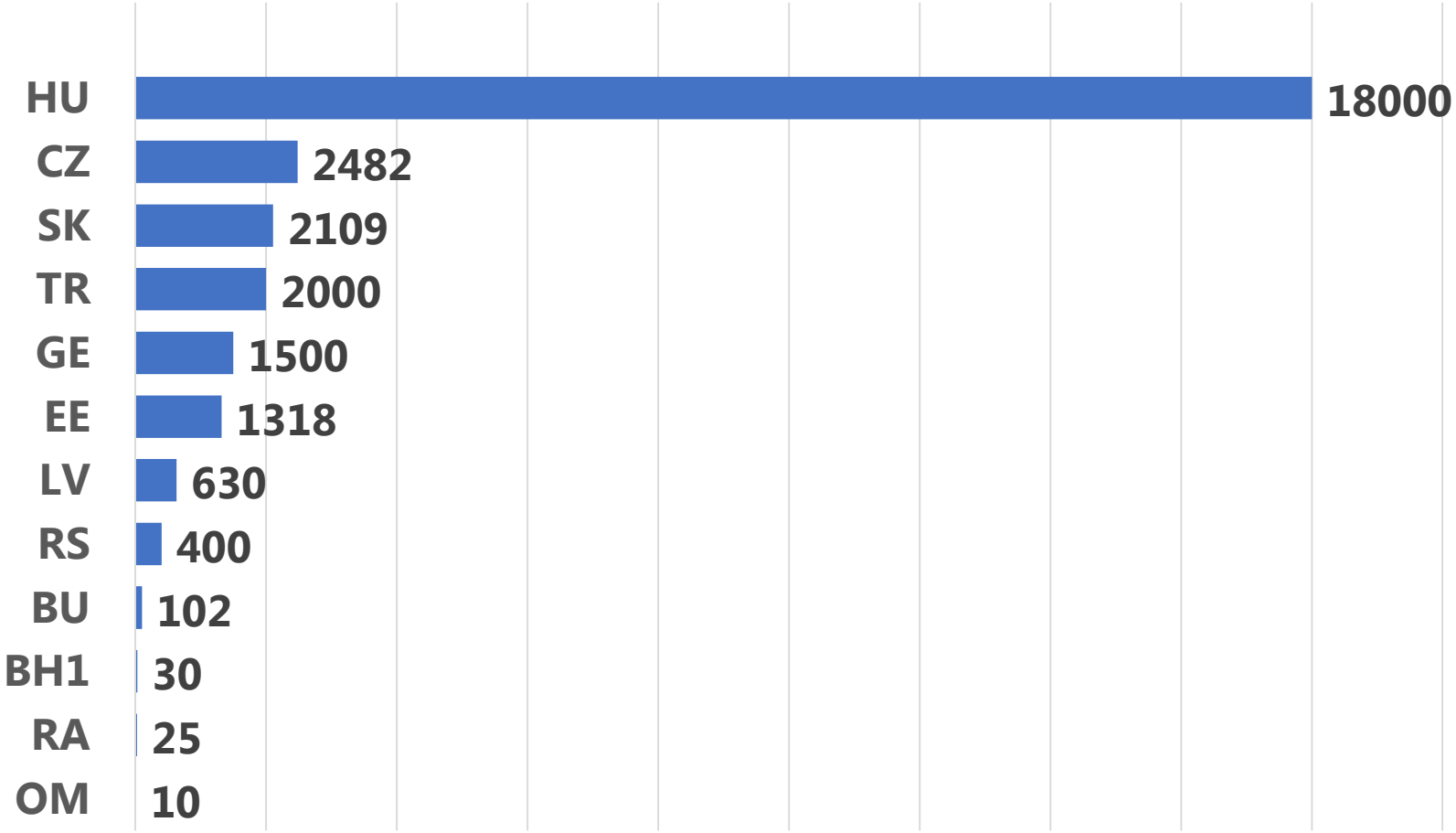
In those three countries – where the roll-out/ spread of e-mobility (EVs and related infrastructure) has reached a relatively advanced stage – the DSOs have limitations in the ownership of charging stations/ infrastructure, which is in accordance with the EU regulations. → Those governments build upon the market in a way that the new market players volunteer to operate the charging stations/ infrastructure. In further six countries the government/regulator does not treat the DSO ownership limitation issue as a critical question or lacking relevant market model did not create limitation rules.

In the long term, the DSO ownership limitation issue could be a relevant question.

Those who are currently involved in the preparation and approval of e-mobility related market model, should first test potential market players before setting limitations on charging infrastructure construction and ownership.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.1. Number of EVs (Battery Electric Vehicle [BEV]+ Plug-in Hybrid Electric Vehicle [PHEV]) at the end of 2019



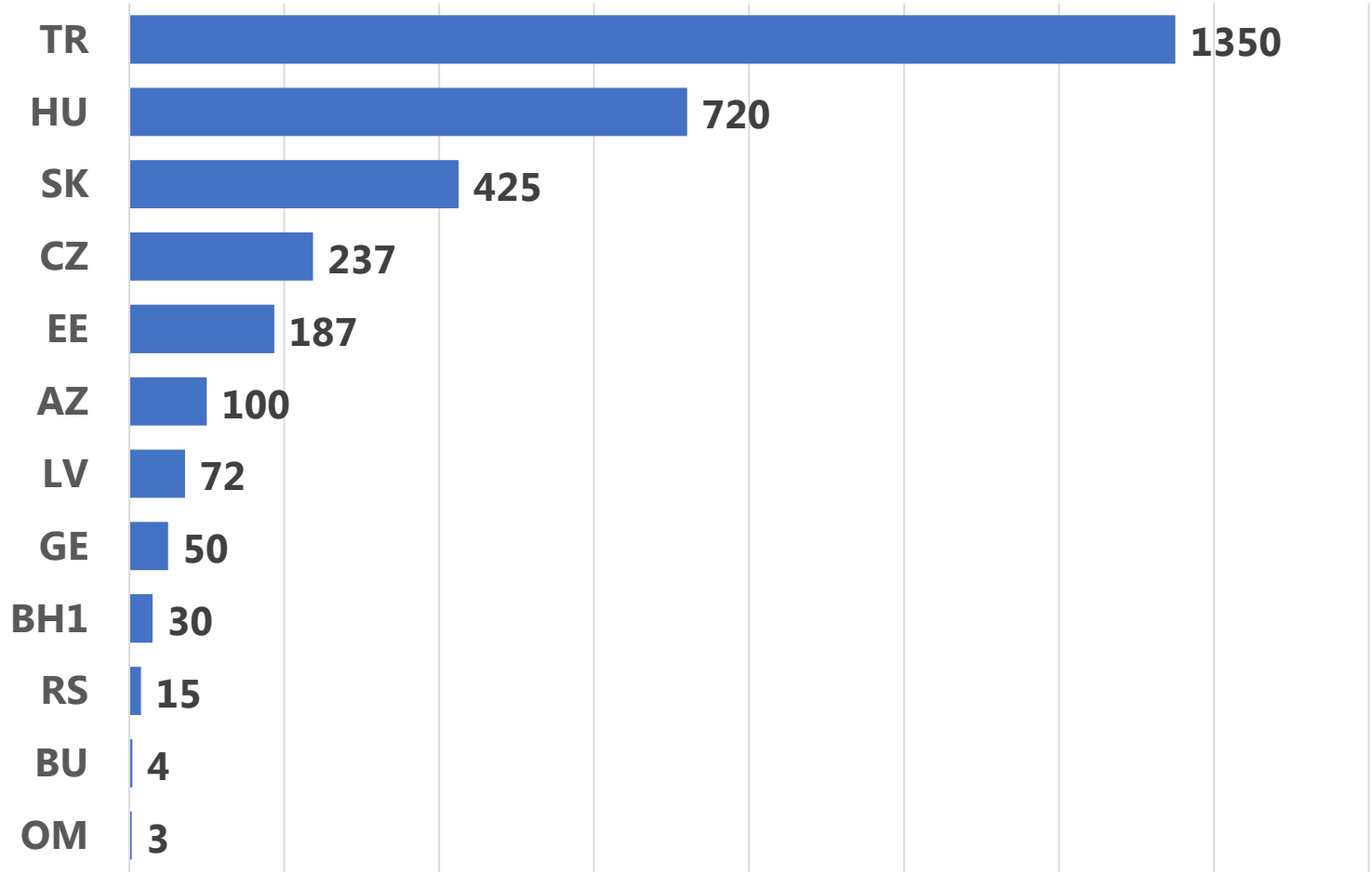
2.1. Conclusion and Recommendation (Number of EVs)

In case a government is committed to e-mobility roll-out, introduces the supportive legal framework (like in Hungary in early 2016 and with the updating and details that followed in 2019) and implements a purchase subsidy for electric cars → the expansion of EVs will follow immediately. The number of EVs is rapidly increasing in several countries.

The Directives of the European Union are and will be a good orientation for those, who are planning the preparation of legal/regulatory frameworks for e-mobility related issues.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.2. Number of electric charging points at the end of 2019



2.2. Conclusion and Recommendation (Number of electric charging points)

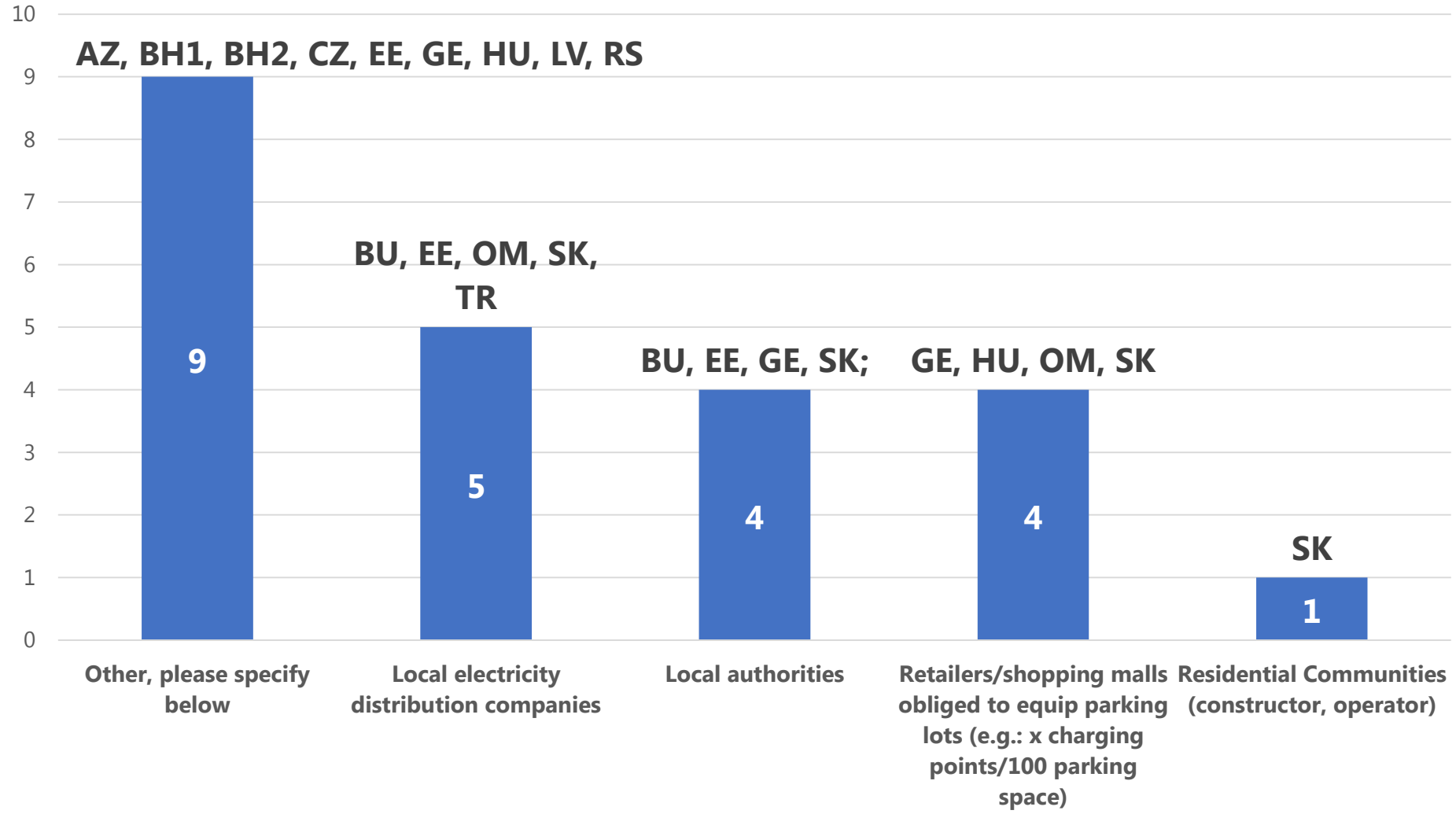
The number of EVs is rapidly increasing in several countries. The number of electric charging points and especially the number of electric charging points per number of EVs or per capita shows a very diverse picture.

Calculating the required number of charging points – based on the present and projected number of EVs – can be a good basis for designing a sustainable EV charging infrastructure system.

The current European Commission's recommendation is 10 EVs for each recharging point and at least one fast recharger in every 40 km.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.3. Whose responsibility is creating charging infrastructure?



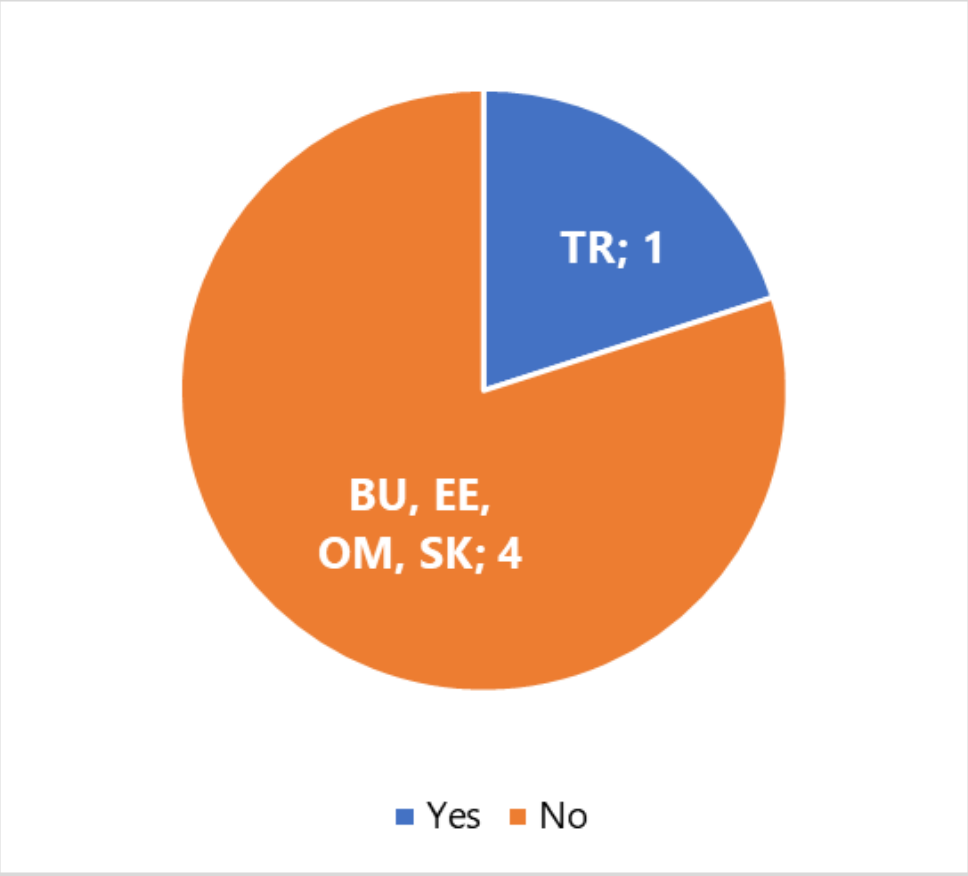
2.3. Conclusion and Recommendation (Responsibility of creating charging infrastructure)

In the ERRA sample, the range of entities involved in construction and operation of charging infrastructure is very wide and already includes residential communities (constructor, operator); retailers and shopping malls with parking lots; local authorities and governments (selecting constructors of charging infrastructure in procurement processes) and local electricity distribution companies. There is one country (Hungary), where – besides different obligations – the government relies on those market players that are ready to construct and operate the charging infrastructure.

Whilst the early EV market is likely to be dominated by users that rely on charging their vehicles at home; electric car drivers want to be reassured they can recharge their car at other times at publicly accessible locations.

Until the market becomes liquid, governments and local authorities could procure companies constructing and operating charging infrastructure and appoint responsible parties.

If local electricity distribution companies selected. Are there any pre-defined rules on phase-out of DSO activity as soon as the market can take over?



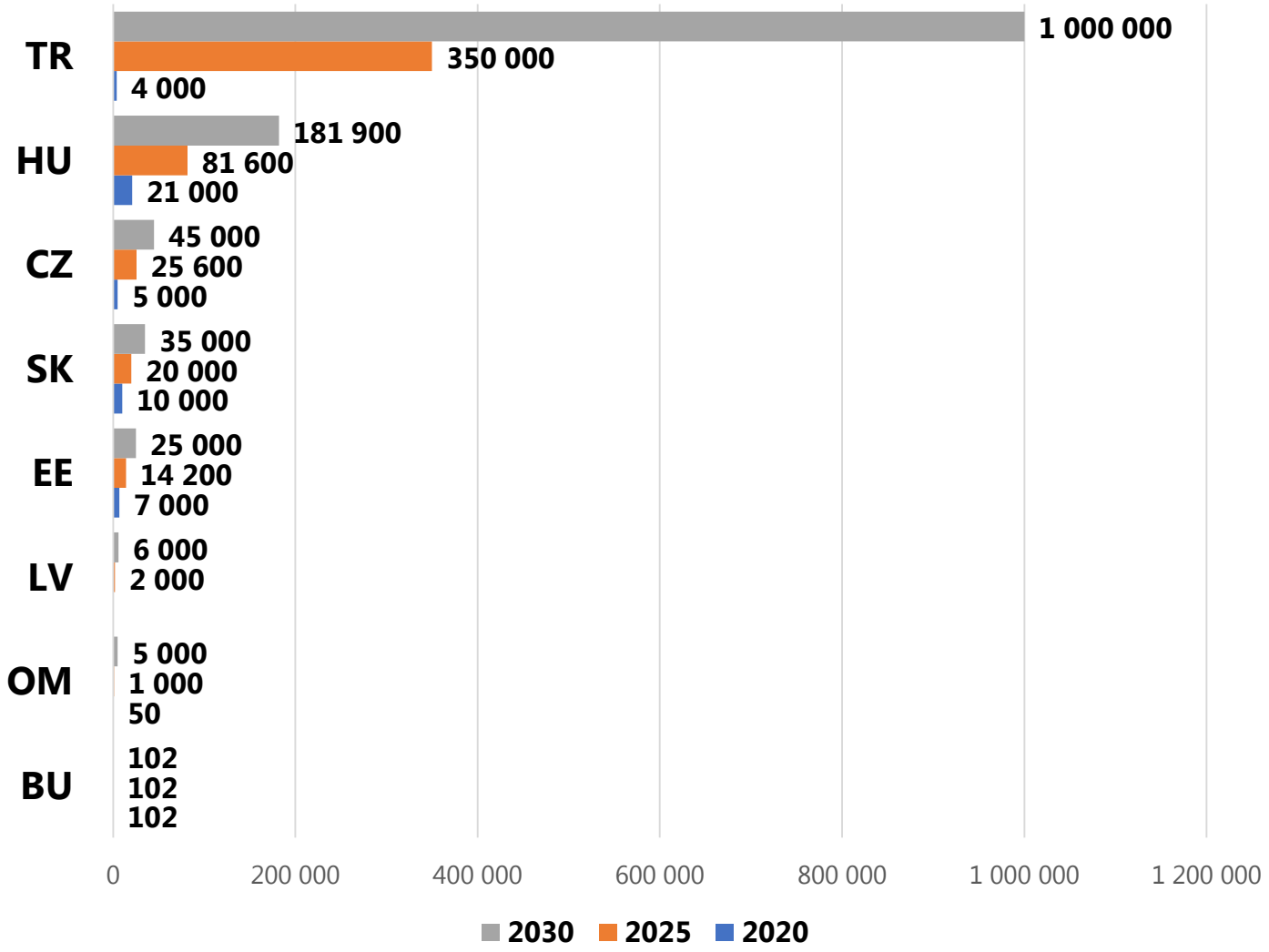
Conclusion and Recommendation

At the early stages of e-mobility market development some governments choose one of the evident solutions – obligating local electricity distribution companies to construct and operate the charging infrastructure. Some of them set this obligation without any pre-defined rules on how to phase-out DSO activity as soon as the market can take over.

When preparing medium- and long-term e-mobility strategy and market model the responsible authorities should consider the stages of implementation of market-based solutions as well.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.4. Projected number of EVs (cars, busses, lorries) in 2020, 2025, 2030 ?

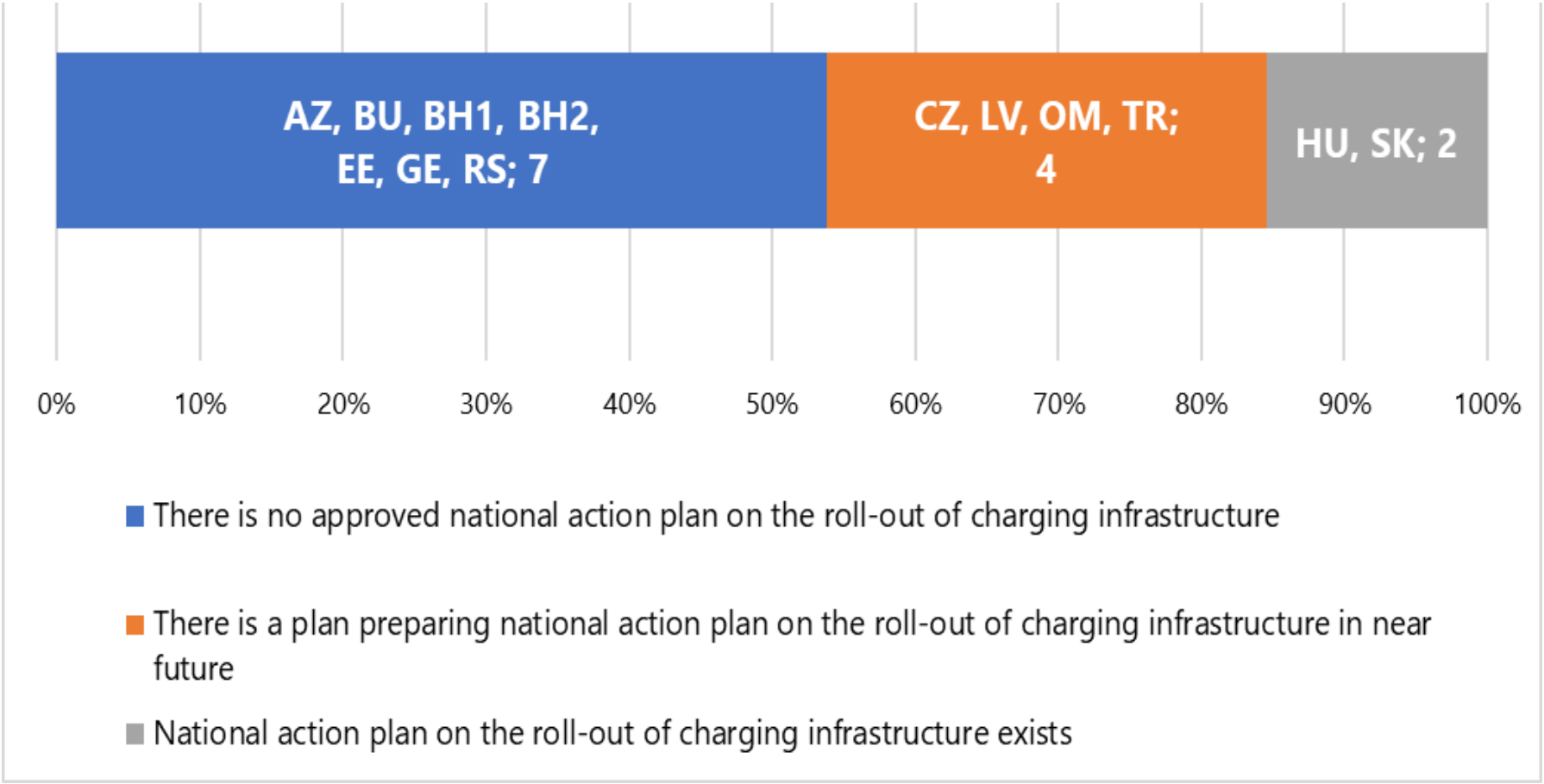


Conclusion

There are countries with very ambitious roll-out plans, while the others have not yet published projected number of EVs for the next decade.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.5. Is there any national action plan on the roll-out of charging infrastructure?



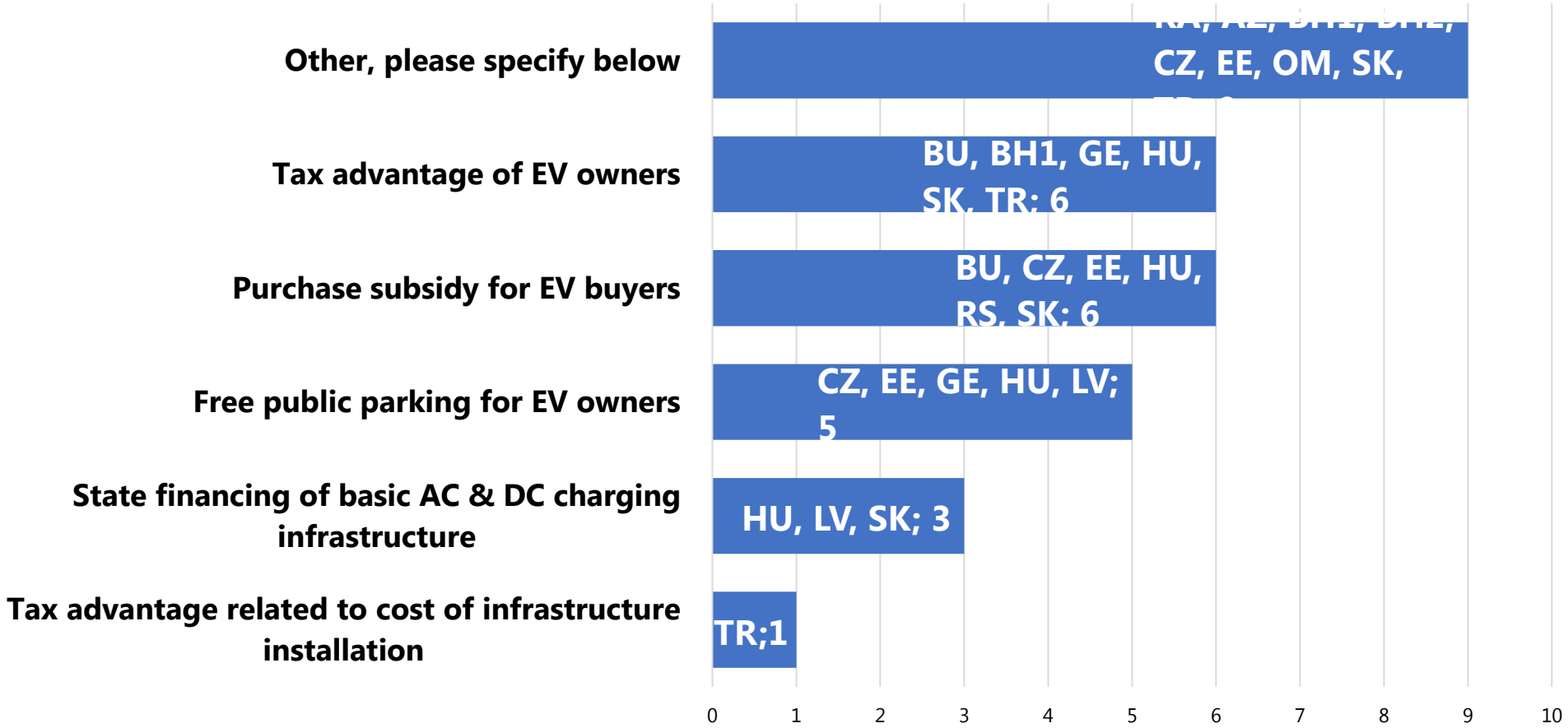
2.5. Conclusion and Recommendation (Roll-out of charging infrastructure)

Half of the countries are planning to prepare national action plans on the roll-out of charging infrastructure or have already prepared different scenarios. The other half does not have or has not yet published such plans.

Published national action plan on the roll-out of charging infrastructure could stimulate potential investors by reducing their risk.

2. Current and Planned Future Roll-Out of EV Charging Infrastructure

2.6. Is there any support (purchase subsidy, tax advantage, free parking, etc.) for EVs and charging infrastructure?

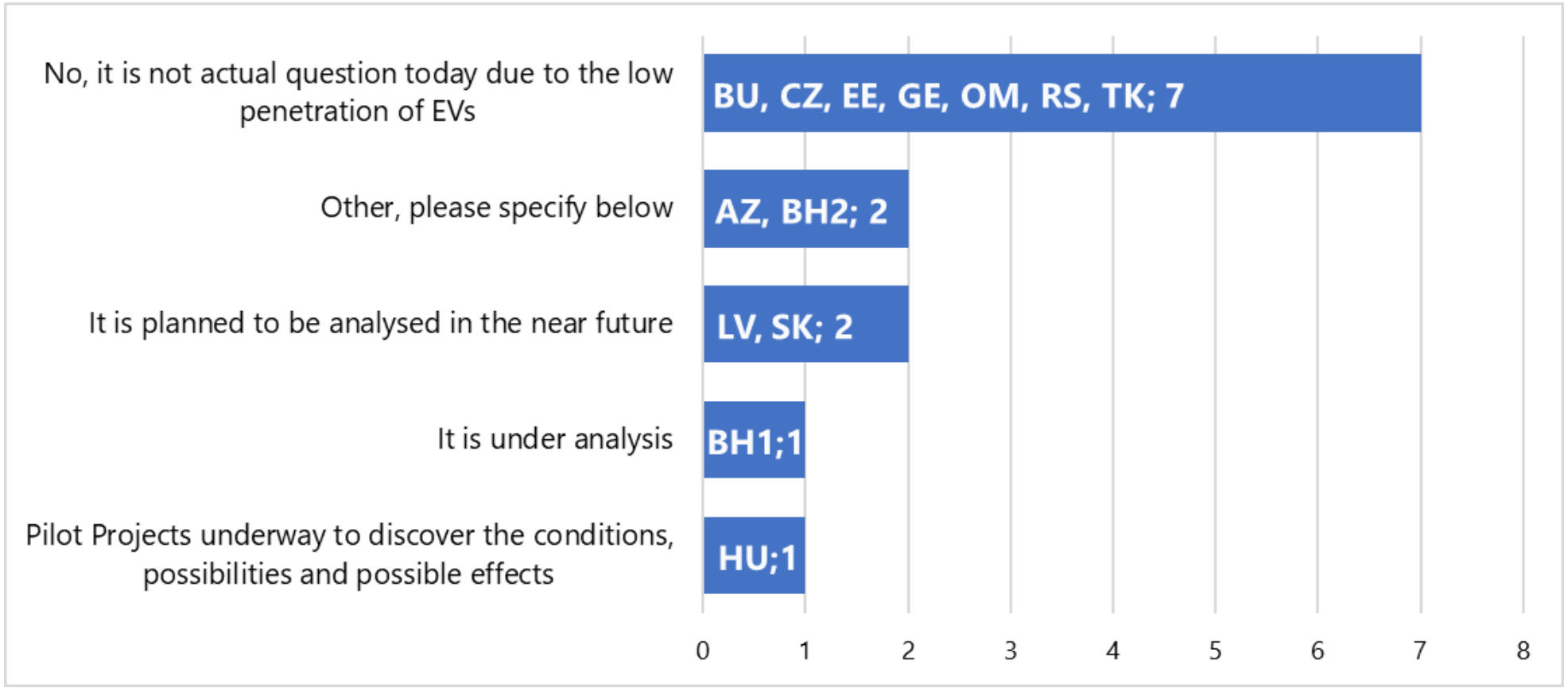


2.6. Conclusion (Support for EVs and charging infrastructure)

There is a very wide range of support mechanisms for EV owners, users, related charging infrastructure and other market participants such as importers. The most common are the purchase subsidy for EV buyers and the tax advantage of EV owners (both subsidies reported in 6 countries). There are various traffic related subsidies in 7 countries for EVs such as; free parking, bus lanes usage (in some cases allowed by a special license plate) or a discounted fee for a ferry. Financial support for charging infrastructure is also widely used – tax advantage for companies with EV fleet, financial subsidy for charging stations and buildings with charging points. A purchase subsidy supporting EV owners in most cases is limited in total volume of cars or in total amount of money. There are also countries reporting a special tariff for EV charging.

3. Electricity System Effects of E-mobility

3.1. Are the V2G possibilities and the conditions of these additional grid services analyzed and discovered in your national electricity system?



3.1. Conclusion and Recommendation (Vehicle to Grid [V2G] and additional grid services; possibilities and the conditions)

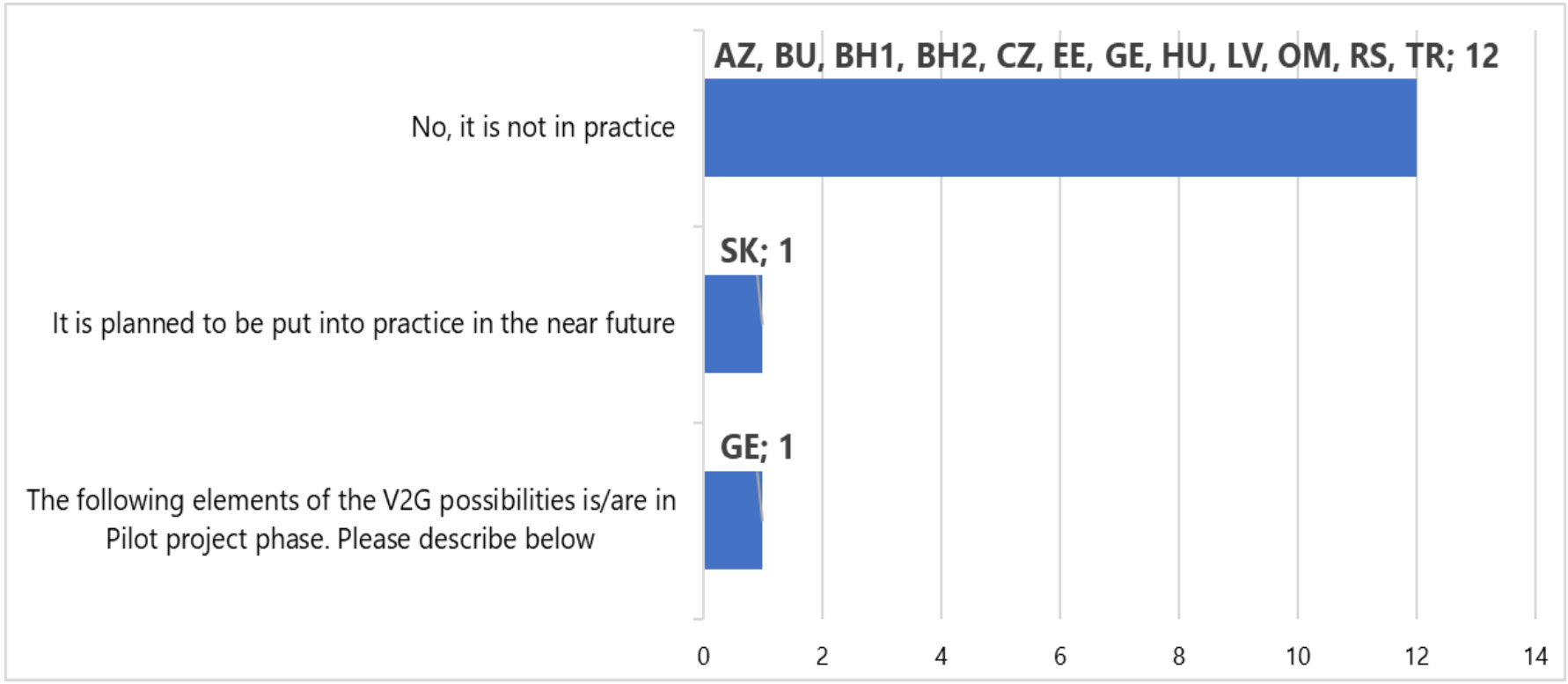
In most cases (7 countries) the Vehicle to Grid (V2G) possibilities and the conditions for these additional grid services within the national electricity system are not yet analysed or considered due to the low penetration of EVs. In case of five countries the issue of V2G is already analysed, planned to be analysed or even investigated in a Pilot Project format.

EV charging could strain (overload) local distribution networks – this situation could require massive network development and consequently network charge increase. Regulators should take into consideration the potential effects of unsustainable EV charging behaviour when not incentivized another way e.g. ToU commodity price, ToU network tariff, RTP (see Q. 3.3.).

EVs also represent an opportunity for a more efficient grid management. If charging is moved to times of low demand or abundant renewable generation, EVs represent a significant opportunity for increased grid flexibility (help to avoid network/ system charge). In parallel, EVs could provide additional grid services through Vehicle to Grid (V2G) solutions, which would leverage the onboard battery to discharge electricity back to the grid when needed or provide ancillary services like voltage regulation. It is highly recommended for the regulators to support Pilot Projects on V2G in order to investigate the potential for grid efficiency gains.

3. Electricity System Effects of E-mobility

3.2. Are there any elements of the V2G possibilities in operation?

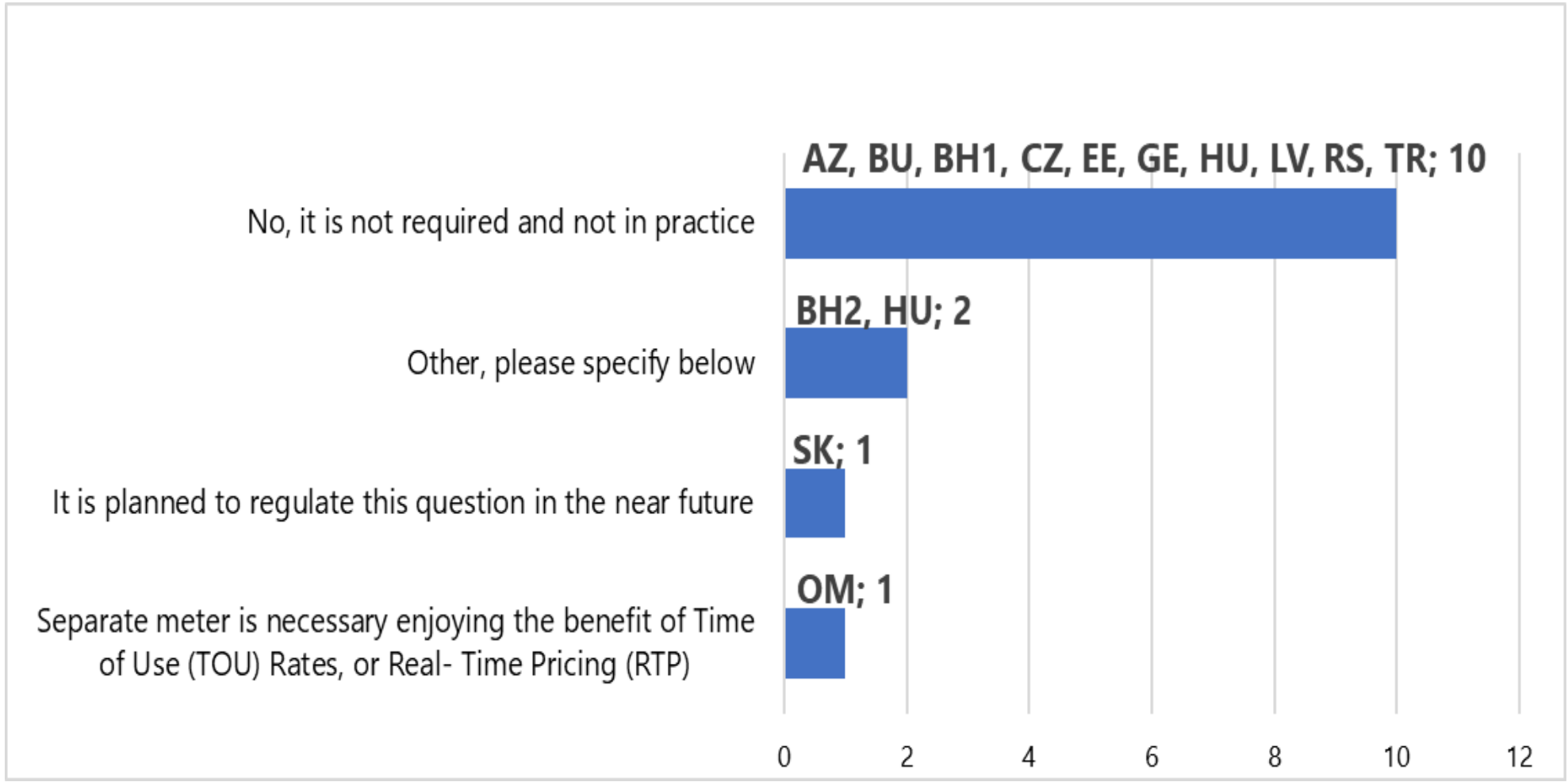


Conclusion

In the ERRA sample, the number of cases of planned or conducted V2G Pilots is still very limited Hungary, Slovakia).

3. Electricity System Effects of E-mobility

3.3. Are there separate meters for the EV home charging?



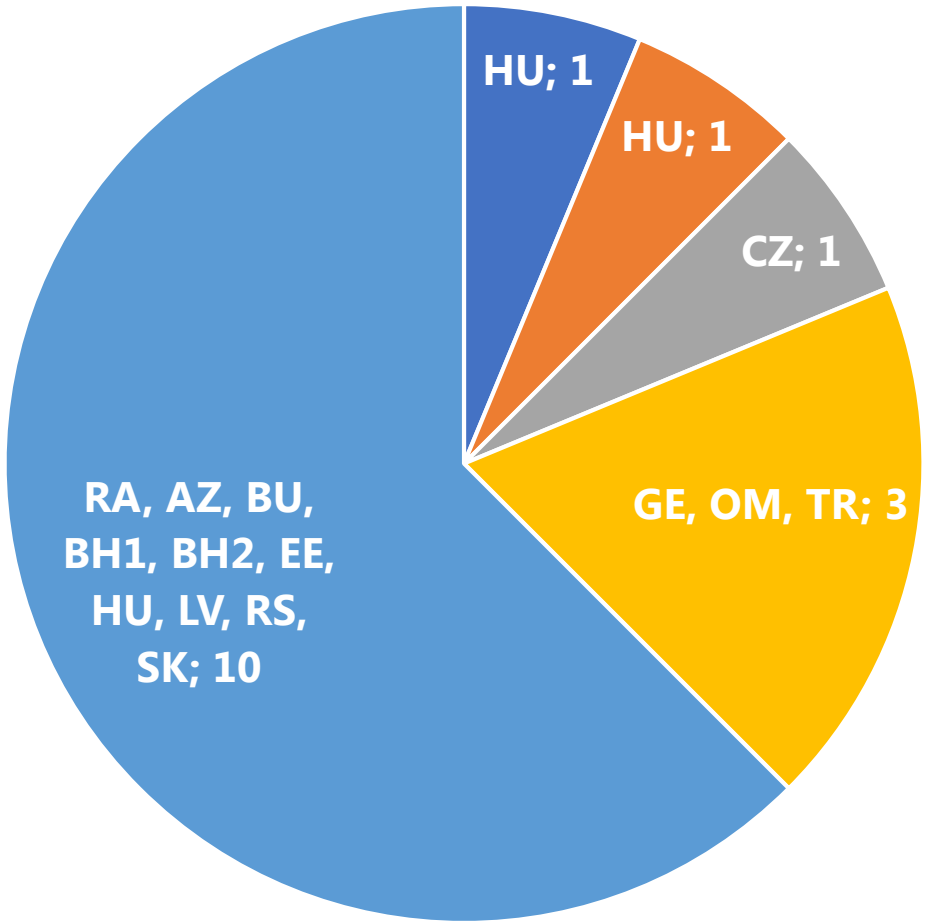
3.3. Conclusion and Recommendation (Meters for the EV home charging)

In most cases (10 countries) separate meters for EV home charging are not required and are not in practice. However, there is a limited number of countries where a special tariff (Time of Use or Real Time Pricing) requires a designated meter, or this issue is planned to be regulated in the near future.

Regulators in countries with low EV penetration could follow international best practice on market models, special EV charging tariff, metering and settlement; this information can help creating their regulatory position on this issue.

4. Role of the National Regulatory Authority regarding e-mobility

4.1. What are the present regulatory roles regarding e-mobility?



- Licensing charging point operators
- Registering charging service providers
- Setting special network tariff for EV users charging their cars
- It is planned to have new e-mobility related regulatory roles. Please describe below
- Other, please specify below

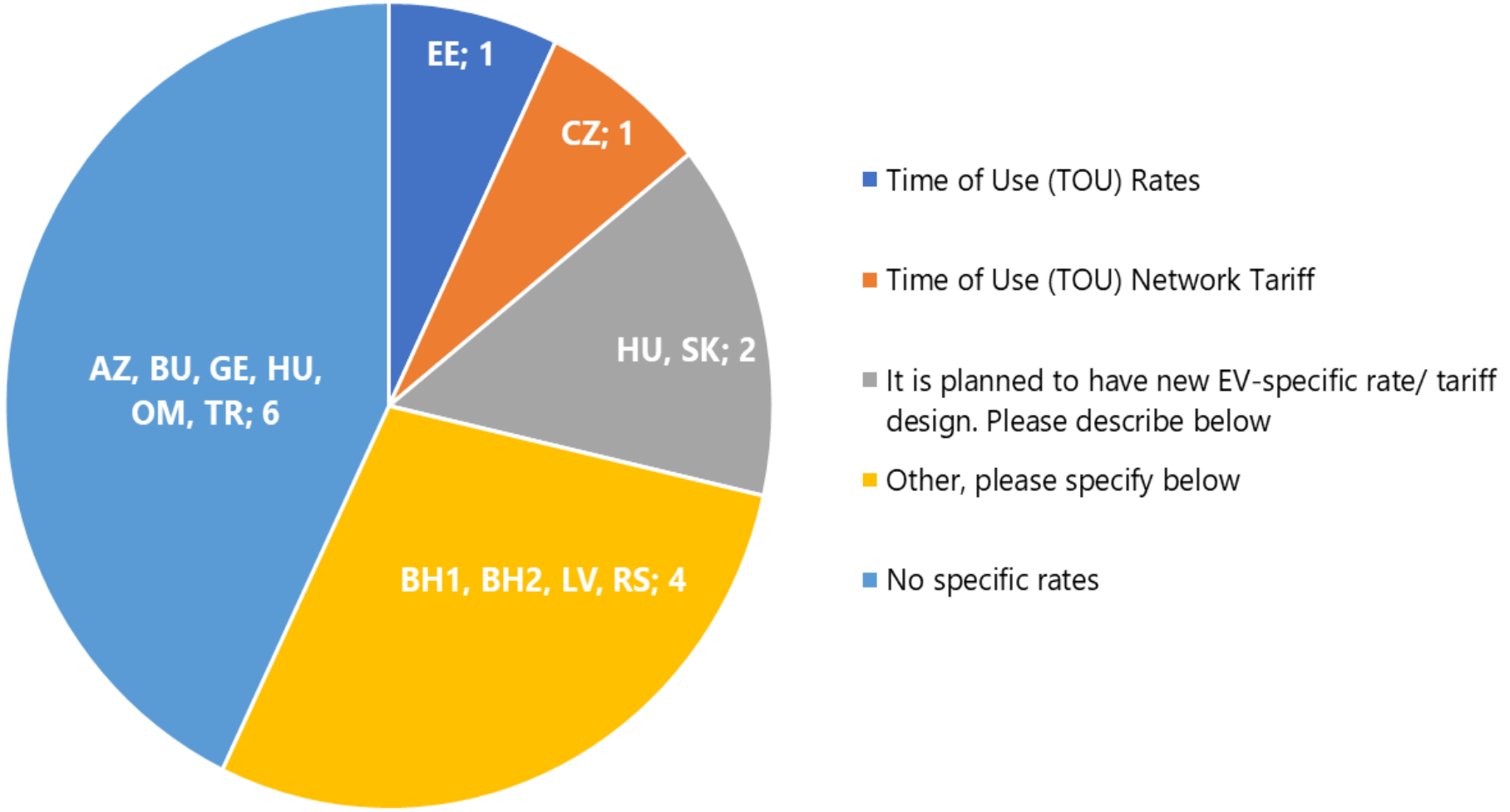
4.1. Conclusion and Recommendation (Present regulatory roles regarding e-mobility)

There is a wide range of already present and planned regulatory responsibilities among responding ERRA members e.g. licensing / registering charging points and charging operators or setting special network tariff for EV users charging their cars. In some cases, we can observe that so far the government and the legislation did not allocate any responsibilities for the regulatory authority regarding e-mobility. However, there is one case (Hungary) where the NRA is actively involved in the preparation of the legal/regulatory framework.

With the spread of EVs and the related charging infrastructure, the magnitude of system effects of EVs and the necessary role of regulatory authorities will become clearer. The NRAs should be prepared for the future, when potential new responsibilities will be allocated to them, such as: regulating connection rules for charging infrastructure (especially fast charging); setting special network tariff for EV charging; licensing or registering charging points and charging operators; approving congestion management rules on electricity distribution system or setting system operation requirements regarding EV charging and re-charging.

4. Role of the National Regulatory Authority regarding e-mobility

4.2. Which EV-specific rate/tariff design elements and/or smart charging are under consideration (or implementation) in your country?



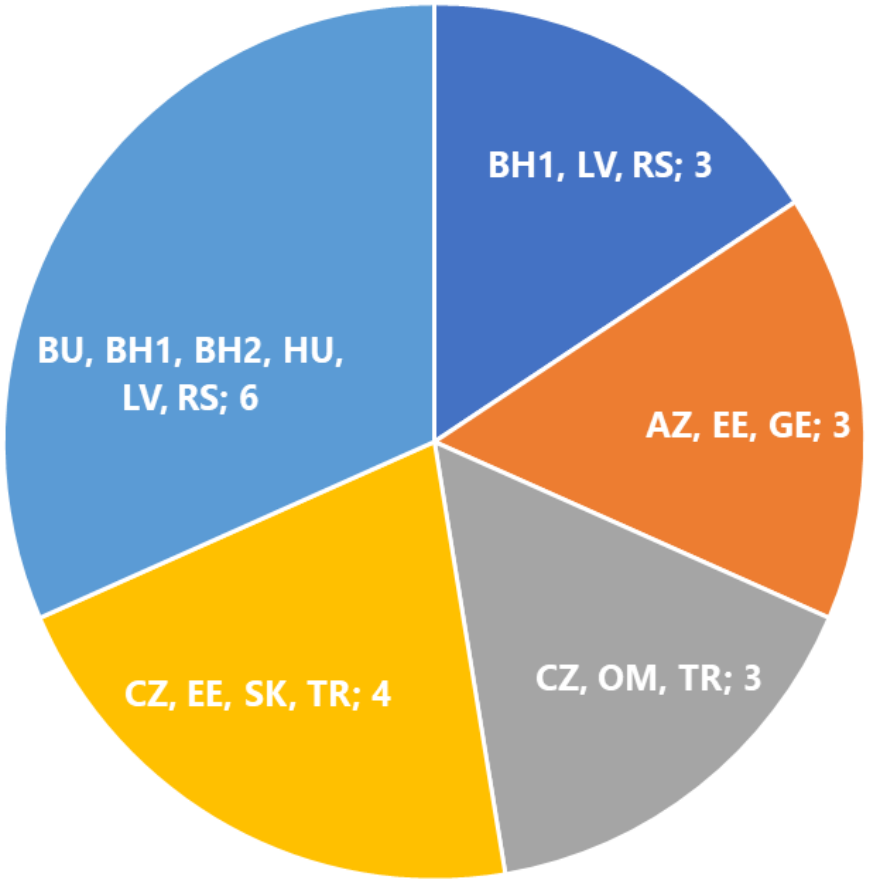
4.2. Conclusion and Recommendation (EV-specific rate/tariff design elements)

There are „only" two cases, where the Time of Use rates or the Time of Use network tariff is implemented for EV charging. In two other cases the general rules for special EV tariff are under consideration. Most of the answers show however, a lack of any special tariff for EV charging right now. In one case it is not the NRA, but the government who sets tariffs for the national EV charging network maintained by the Road Traffic Safety Directorate. In this country the tariffs for private charging stations are set by the service provider (market price); these tariffs are usually set at EUR/ min.

Regulators in countries with low EV penetration could follow international best practice – with a focus on dedicated EV charging tariff and commodity price. At the end of this report, among the "Some important resources materials" the NARUC Report on „Electric Vehicles: Key Trends, Issues, and Considerations for State Regulators" (October 2019) could be a good basis for exploring possible e-mobility tariffication methods.

4. Role of the National Regulatory Authority regarding e-mobility

4.3. Does your regulatory authority co-operate with other sectoral regulatory authorities with regard to e-mobility?



- Yes, with regulatory authority of transportation
- No, there is no informal co-operation
- Please, briefly describe the format/ topics of cooperation if any (joint working groups, cooperation for development of legal drafts on regulatory issues, etc.)
- Yes, with other authority responsible for, please specify below
- No, there is no formal co-operation

Conclusion

The answers show a diverse picture. Most of the NRAs cooperate with the Ministry responsible for energy and/ or transportation. Limited number of NRAs cooperate with the regulatory authority responsible for transportation. One NRA informally cooperates with the competition authority.

5. Is there any special sub-topic within e-mobility that would be of interest to you?

The responding NRAs are interested in the following aspects regarding e-mobility: the role and responsibilities of regulatory authorities; best regulatory practices; different regulatory practices of ERRA members; regulatory practice of network access of EV charging infrastructure together with general regulatory issues related to this infrastructure and V2G regulation issues.

Depending on the roll-out tendencies/ speed of EVs and charging infrastructure penetration the relevant ERRA committees / working groups could continue the discussion on e-mobility regulatory issues.

Read the full Survey Report!

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THANK YOU
FOR YOUR KIND ATTENTION!

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