

Clean energy for  
EU islands:  
**Gamechanger award**  
Implementation of EV  
charging infrastructure  
Syros, Greece

# **Technical assistance through Gamechanger awards for Syros Implementation of EV charging infrastructure**

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## Summary of technical assistance

Syros municipality has been proactive in preparation of mandatory Electric Vehicle Charging Plan in coordination with distribution system operator, HEDNO. The plan has been adopted and it foresees thirty four charging locations on the island. Based on the previously analysed implementation approaches, the municipality has been considering partner collaboration through joint-venture or concession approach.

In this report we analyse the advantages and disadvantages of both approaches and for the initiation of the implementation of the charging infrastructure we recommend concession based approach, implemented through single procurement procedure with multiple charging location lots. The details of the aspects of preparation of the procurement procedure, as well as references to various best practice procedures and guides for implementation of public charging infrastructure by municipalities is provided.

Finally the report provides suggestions for the next steps which are expected to take place in the coming year. The uptake of EVs is expected to continue and further increase, even more in light of the ongoing EU energy situation and Russia-Ukraine war.

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# 1. Introduction

The municipality of Syros developed strategy of EV charging infrastructure installation in alignment with the national regulation for promoting the development of municipal EV charging plans. Municipalities sectors responsible for transport and urban planning selected EV chargers' locations for the first deployment in coordination with the DSO (HEDNO). The Electric Vehicle Charging Plan (EVCP) of the Municipality of Syros Ermoupolis: Analysis of the Existing Situation and Mapping of the Intervention Area proposed EV charger types, numbers, and locations of EV chargers.

The Electric Vehicle Charging Plan of the Municipality of Syros Ermoupolis proposed thirty-four (34) EV charging points: thirty-one (31) stations refer to normal power stations (4 AC 1x22 kW stations with one power supply and 27 AC 2x22 kW stations with two power supplies) and two stations refer to high power stations (2 DC stations 2x50KW with two power supplies). The one charging station proposed for the service of electric bicycles is not included, as the requirements for both installation costs and supplied power are small.

Smart electromobility in Syros, Greece<sup>1</sup> gave an overview of potential ways of starting electrification in transport and comparative analysis of approaches already taken around Europe. As explained, various EV charger infrastructure business models are in place in Europe, from demand driven, planning-oriented up to business-oriented approach. Based on already taken activities in EV charging plans development, Syros Island made first steps in electromobility with planning-oriented approach, where EV types and charging locations are already defined and selected in the developed document.

A guide for public authorities for electricity vehicle charging concession is presented in EIB report<sup>2</sup> "Electric Vehicles Charging Concessions: A contract guide for public authorities", where the project development chain is presented in Figure 1. Four phases<sup>3</sup> and five activities are defined to be: project identification, choosing a partnering approach and preparing for procurement and implementation. The phase one, project identification is considered to be completed with the adoption of the EVCP, mentioned above. The technical criteria of selected locations are already considered by DSO, whereas land ownerships of specific locations are reviewed by the local authority. The second phase, **project assessment and preparation** is split into two subphases: choosing a partnering approach and preparing for procurement. This report is focused on this second phase.

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<sup>1</sup> Smart electromobility in Syros, Greece, Clean energy for EU islands secretariat report, 2022 ([Link](#)).

<sup>2</sup> EIB Electric Vehicles Charging Concessions: A contract guide for public authorities, 2022 ([Link](#)).

<sup>3</sup> EIB European PPP Expertise Center: PPP Guide, 2021 ([Link](#)).

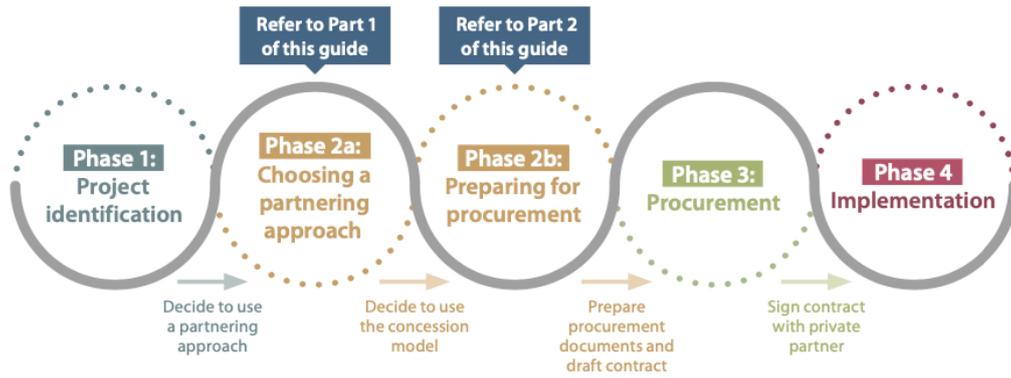


Figure 1. EV charging infrastructure project development<sup>4</sup>

Smart electromobility in Syros, Greece report presents five different methods for implementation of charging infrastructure are presented: public contracting, joint-venture, concession, availability-based and license models. The Municipality of Syros has decided that based on their local circumstances they are considering two main models, namely joint-venture and concession models. These two models will be further discussed in this report, in regards to project assessment and preparation phase.

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<sup>4</sup> idem

## 2. Project assessment and preparation: specific considerations and best practices

The implementation of EV charging infrastructure on the Syros island should be approached as a project, taking into account above mentioned four realization phases. The municipality should define dynamics of project realisation, identifying starting periods and deadlines for each of the phases. The procurement of the first charging stations is expected to be implemented within 2023.

The project assessment and preparation phase is split into two subphases: choosing a partnering approach and preparing for procurement. Namely in choosing a partnering approach, Syros municipality already limited the choice to two options which will be analysed here: joint-venture and concession approach. To start preparation for procurement subphase, we discuss here:

### Choosing a partnering approach

Considering the location for the EV charging infrastructure has been planned with the adopted EVCP, the next steps include investment in and installation of the charging infrastructure and its operation and maintenance (O&M). Two chosen approaches, joint-venture or concession both involve a private entity participation. However, they are very different when it comes to risk assessment. Joint-venture approach includes creating a joint entity between municipality and private entity where all project risks are shared. When it comes to concession, the concession agreement defines which risks are shared or placed on municipality and which on the private entity. The comparison of the risks between the two approaches is presented in Table 1.

Table 1. Comparison of risk allocation between joint-venture and concession approach.. Modified from EIB report<sup>5</sup>.

Risk type	Joint-venture	Concession
<b>Site selection</b> (identification, acquiring)	Shared or public	Public or private
<b>Permitting process</b> (authorisations, permits, inspections etc.)	Shared	Private or shared
<b>Installation</b> (cost, time, safety, defects etc.)	Shared	Private or shared
<b>Operation</b> (cost, performance, maintenance, repairs etc.)	Shared	Private
<b>User demand</b> (revenue)	Shared	Private or shared
<b>Technology</b> (upgrade software or hardware, communication standards, obsolescence)	Shared	Private
<b>Legislation and regulatory changes</b> (standards, etc.)	Shared	Shared

<sup>5</sup> EIB Electric Vehicles Charging Concessions: A contract guide for public authorities, 2022 ([Link](#)).

<b>Financing</b> (capital investment, operational costs, etc.)	Shared	Private or shared
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**Joint-venture approach** could take two scenarios:

- One-step approach – municipality would organize one tendering procedure to find private entity that would partner with the municipality in creating a joint-venture entity which will become municipality partner in the process. In this case all risks will be shared within the joint-venture.
- Two-step approach – municipality would organize one public procurement procedure for installation of the chargers, and the second procurement procedure for joint-venture of charge point operator.

In two-step approach the municipality would be investing in charge points and their installation. The public tender organisation requires time and local entity engagement. As result, a selected private entity will install EV charging infrastructure in selected locations. Another public invitation for O&M of already installed EV charging infrastructure should follow. Such public tender participation will be limited for a qualified private company with O&M experience with the installed EV charging infrastructure. EV charging production is still on the beginning phase, with setting up technological, communicational standards and protocols<sup>67</sup>, so an operating and maintenance service contract is often agreed with the same entity that supplier and installed the EV chargers<sup>8</sup>. Hence, we currently do not recommend the two-step approach to Syros municipality. Moreover, this would result in relatively long administrative process for the small number of chargers, which would be less beneficial for the private entity and decrease number of interested parties.

In joint-venture approach municipality should have capacity to be involved in not only the process of public procurement (specifications and contracting), but also in financing, installation, operation, maintenance and use of the infrastructure. EV charging technology is constantly improving and Syros municipality should definitely work on acquiring more know-how of this technology and its use. However, considering that implementation of chargers is just starting in Syros and that there is not enough know-how and unclear market yet, we recommend that the municipality does not take up technology or operations risk. In addition, if maintenance or upgrade of chargers is needed and it is within the joint-venture where public financing is involved, the implementation procedure should be clarified, as to decrease unnecessary delays and administration. Therefore, the joint-venture at this initial stage of EV charging infrastructure implementation brings unnecessary risk to the municipality and can be inefficient in implementation.

In the **Concession approach**, the municipality will still have control over project realisation. The risks associated with processes from installation to exploitation (including user-demand risk) are typically transferred to the private partner. However, these risks allocation can be tailored to the specific circumstances in concession agreement.

The financial risk, as indicated in Table 1, can be shared or taken up by the private entity. The capital investment can be enabled by national grants and local funding. In this case municipality

<sup>6</sup> ECOS & RAP Briefing: Standards for EV smart charging: A guide for local authorities planning for future-proof charging infrastructure in cities, 2022 ([Link](#))

<sup>7</sup> Best practice for future proofing electric vehicle infrastructure, Baema, 2020 ([Link](#))

<sup>8</sup> Energy saving trust, Procuring electric vehicle chargepoints for local authorities ([Link](#))

could decide to share the financial risk. If municipality shares financial risk it should be reflected in expected revenue share. The private partner could also take over the financial risk and related investment, with or without financial support from the municipality. In this case the private entity is compensated directly through revenue or indirectly compensated by municipality for the approved financial support over the duration of the contract, only if the infrastructure is continually available for its intended use.

In the similar manner, user-demand risk should be also regulated with the contract as it can be shared or taken over by the private entity. The risk can be managed in both directions: If demand will likely exceed the level required to generate a reasonable return, the municipality might even demand a fee or share of the revenues, or if demand is unlikely to be sufficient, a return of investment might only be viable if the public authority agrees to provide financial support. A predictable and fixed O&M incentive support can avoid the user-demand risk at the initial stage of EV charging infrastructure realisation at Syros Island. This is in line with planning-oriented implementation of charging infrastructure approach, where locations selection is designated by municipality and is not subject of the project realisation. In the case of public O&M incentive, infrastructure availability and operation should be assured by financial guarantee. Finally aside from flexibility in risk assignment and management, the concession approach, in comparison to joint-venture allows more control to the municipality on the dynamics of implementation, both for when the procurement will happen and how many and location of chargers will be implemented.

## Preparing for procurement

### **Realisation dynamic and EV chargers locations lots**

A preparation for procurement for private entity selection is the next action in the project realisation. But the municipality should decide on the dynamics of realisation both related to time and to the EV charging stations (location and number). Based on the installation plan, for fast implementation, the proposal is to have a single public selection procedure.

EV charging infrastructure development project can be realised in one or many locations lots. Such organisation can be related with successive steps, one after another. The lot or charger group should be leveled to be equally attractive for private entities. The revenue-generating potential of EV charging points varies from place to place. Market forces alone will drive private sector parties towards installing EV charging infrastructure in areas with opportunities for higher, faster, and safer investment returns. Under the concession models, where the private partner bears user-demand risk, unprofitable (or less profitable) locations need to be bundled with more profitable locations to ensure the private partner will make a reasonable return on its investment that should be defined in preparation procurement phase with interaction with potential private investors. Number of groups can vary, but based on EVCP and selected 33 locations, we recommend creating few groups only, so that attractiveness to participate on the project realisation is maintained. Selected locations can be divided in two or three groups, each of them for installation and O&M of about 16 or 11 EV charging locations, respectively. The public procurement should be organised at the same time for all lots to allow for competition. A private entity should be able to apply to only one EV charger lot.

### **Applicants requirements**

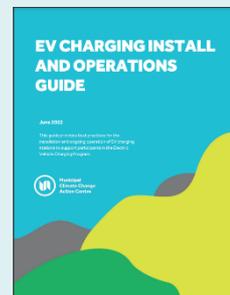
Strict technical capacities and experience in EV charging infrastructure should be proposed as the selecting criteria in order to minimize risk of process realisation. List of proposal checklists for installation and requested information from applications are listed in EV charging install and

operations guide<sup>9</sup> and extracted in the box below. Technical infrastructure specifications for small and large vehicle chargers are already provided in the EVCP adopted for Syros municipality.

### Information to Request from Applicants

#### System Design

- Description of the proposed EV charging installation system, including a preliminary design and drawings/renderings which illustrate the proposed layout at the site
- Specification sheets for all proposed equipment including warranty details for the chargers and any other critical equipment
- Description of the proposed network and data monitoring system
- Description of any operation and maintenance service plans, if applicable
- Estimated annual earnings from EV chargers



#### Company Details and Experience:

- Name and role of project team members (including any relevant certifications)
- Name of subcontractors and their role in the project
- Relevant experience and references for systems as similar as possible to the desired request
- Company safety certifications
- Confirmation of company insurance certificates (general liability, or other insurance that may be required for the company to be working on municipal sites)

#### Work Plan and Schedule:

- Detailed proposed workplan and schedule for the project including time and duration of any activities that could disrupt regular operation

#### Project Costs:

- Total costs of the project
- Request a breakdown of the cost estimate (excluding ongoing costs) based on the desired services; a simplified breakdown may be as follows:
  - EV charger equipment costs
  - Installation labour costs
  - Engineering and design costs
  - Permitting and inspection costs
  - Signage costs
  - Other electrical components
  - Other costs
- Description of the ongoing costs associated with networking fees per connector and the transaction fees
- If any services are optional, request their costs be clearly separated from the required services to enable a fair comparison of costs across multiple proposals

Project dynamics should be in line with requested criteria. So, the technical criteria can be guaranty that selected private entity/ies will implement the EV charging infrastructure in proposed timeframe and O&M in good order during contracting period.

<sup>9</sup> EV charging install and operations Guide, Municipal Climate Change Centre, 2022 ([Link](#))

Also, the special care should be focused on smart charging standardisation: ensure that infrastructure meets the latest available smart charging standards, integrating upgrades of new standards, sufficient computing and memory capacity for future-proof infrastructure, technical documentation about protocol applied, implementing existing and anticipating upcoming standards<sup>10</sup>. Requiring from private partner to guarantee upgrades and preparing for upcoming standards in parallel is the best way to ensure future-proof infrastructure. The technology specifications should also allow charger usage data and consumption sharing within defined time frame with the municipality. This is important to foresee necessary changes or expansion in charging infrastructure planning.

### **Charging tariff/price**

One of objectives of EV charging infrastructure is to create and maintain competitive market that enables fair prices for users/EV drivers. Competitive market for EV charging infrastructure can be established by public procurement, but also with infrastructure grouping. Greek islands have regulated electricity prices in comparison with EU regulation on electricity market and mainland. This characteristic can be transferred to EV charging price, at least, in a short term of project realisation. Charging price and indexation should be clearly and transparently set up during preparation for procurement phase. The rate should reflect the capital and operating costs of the charge points, including ongoing electricity charges, maintenance, and customer service.

Regarding seasonality effect on Syros Island, the charging price should be differently determined for tourists and Syros local businesses and citizens. This can be implemented through energy community, initiated by the municipality. Moreover, the pricing should reflect availability of locally generated RES, so that to encourage EV users to charge in the time when local RES generation is available. Finally, the price can be dynamic with time to discourage EV users occupying the charger for longer periods of time, to allow for usage especially during summer season.

Cost-Benefit analysis methodologies are elaborated in EVCP, where the cost of capital or the initial investment, the interest rate, the return on the investment and the life of the investment, as the main investment elements are elaborated. Two methods, based on the simple economical parameters, are analysed: simple pay back and Net Present Value.

Cost-Benefit analysis results for the exploitation scenario by the Municipality of Syros are simulated based on the following parameters:

- Capital cost is 5,000 EUR for simple 9,500 EUR for dual EV charging point.
- Capital cost for DC charging station is approximately 35,000 EUR for single and 55,000 EUR for double plugs,
- Discount rate is 4 %
- duration rate 15 years,
- annual operation costs are sum of:
  - fixed cost of 1,500 EUR for AC and 3,000 EUR for DC
  - variable cost, as product of charger installed and energy cost for charging service and energy consumed in stand-by regime and
  - rental on annual income (5 %).

The charging price of the service is set at 0.37 EUR/kWh for the charging stations that will serve passenger vehicles (cars, TAXI, catering vehicles, disabled) which has resulted from the European

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<sup>10</sup> ECOS & RAP Briefing: Standards for EV smart charging: A guide for local authorities planning for future-proof charging infrastructure in cities, 2022 ([Link](#))

Fuel Price Action Comparison<sup>11</sup>. For DC charging stations that will serve large vehicles, the charging price is set at 0.7 EUR/kWh. This proposed price should be further modulated for various type of users and time of use.

The number of EV vehicle on Municipality of Syros – Ermoupolis is scaled based on the national prognosis of EV vehicle in Greece up to 2030 and 2050. Based on this prediction, number of EV vehicles on Syros Island will be in 2022 and 2037 10.5 and 1,272.7, respectively.

## Concession agreement

A lot of concession models for EV charging infrastructure are already in place. Models differ with capital expenditure, founding or grant implemented, user-demand, operating costs, responsibilities, and revenues. Future concession argument should address potential capital costs by available national and/or local granting schemes or subsidies, O&M should be organised by concessionaire, operational cost approved by concession grants, revenues linked with user-demand and capital investments. Some of them is listed in existing Baema report<sup>12</sup>.

Structure and content of the concession contract should include<sup>13,14</sup>:

- duration of the contract - from the completion of installation of equipment to the end of usage.
  - Example concession periods in municipalities in Netherlands 3-8 years<sup>15</sup>. However keep in mind this includes significantly larger number of charging points then in Syros.
- charging location sites – discussed in more details above with proposal of use of municipality defined lots (groups of charger locations).
- design and installation of EV charging infrastructure
- operation of the EV charging infrastructure and services
  - Data access needed for municipality for further planning
  - Potential relocation of the charger if the data shows non-feasible demand data
- payments and pricing
  - should be transparent and clear to charger user
  - should encourage the use of local generated RES
  - should be less for locals and local businesses than for other users
  - should be modulated to discourage EV user staying at the charger for a long time
- financing and public authority support,
  - Include what happens if the chargers are underused or if they are overused, as discussed under risk of demand above.
- insurances, changes,
- complying with laws and regulations,
  - and standards/upgrade of equipment if needed
- relief, compensation and force majeure, liability for claims,
- early termination and expiry and removal of a charger.

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<sup>11</sup> <https://alternative-fuels-observatory.ec.europa.eu/consumer-portal/fuel-price-comparison>

<sup>12</sup> Best practice for future proofing electric vehicle infrastructure, Baema, 2020 ([Link](#))

<sup>13</sup> Sustainable Transport Forum, Summary Handbook Of the STF Recommendations for public authorities for procuring, awarding concessions, licences and/or granting support for electric recharging infrastructure for passenger cars and vans 2021 ([Link](#))

<sup>14</sup> EIB Electric Vehicles Charging Concessions: A contract guide for public authorities, 2022 ([Link](#)).

<sup>15</sup> <https://nklnederland.nl/aanbestedingsoverzicht-voor-plaatsing-laadinfrastructuur/>

### 3. Conclusions

The public procurement for installation and operation and maintenance of EV charging infrastructure selected in the EV charging plan for Municipality Syros should be organised in the one public selection procedure. To accelerate local market creation, the public procurement can be organised in two or three, equally attractive, EV charging locations lots, groups of charging locations. The technical capability and recent experience in EV charging installation and operation and maintenance should be criteria or preconditions for private entity/ies selection. While Syros municipality can take over the site risk, and share permitting and legislation change risk, the private entity should take over installation, operation, and very important technology risk. Depending on available funding, the municipality should weight the possibility to share financial risk, and demand-side risk as discussed here. The private entity/ies should and reasonable pay-back period on its investment within acceptable Considering this is the initial stage of implementation of EV charging infrastructure and while EV uptake is expected to continue<sup>16</sup>, user-demand risk of EV charging, at the first selected period, should be relaxed from the private entity/ies shoulders.

The discussed process analyse only the charging infrastructure already foreseen in the adopted EVCP. For the future development, the municipality should decide if they will update the plan based on the EV charger usage data provided by the charge point operators, or the expansion of the plan will be based on the demand driven approach. Update of the existing plan should be initiated within foreseen timeframe which is clearly communicate, to ensure that the market and further uptake is followed by not only local stakeholders but also interested private sector stakeholders. Therefore for further expansion we recommend combination of demand driven approach and planning approach, in order to follow the development of the activities and demand on the island.

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<sup>16</sup> European EV charging infrastructure masterplan, ACEA 2022 ([Link](#))