

2018 NKL EV Public Charging Benchmark Report – Utrecht, December 2018

## **Accelerating progress to a mature market Market, government, science sector and grid operators must act together**

**The Netherlands Knowledge Platform for EV Public Charging Infrastructure (NKL) presents the results of the 2018 NKL EV Public Charging Benchmark Report. The average cost of a new charging station is still falling, but market forecasts for 2025-2030 predict only a moderate drop. Meanwhile, use of public charging stations is rising steadily – 2018 saw a 15% increase. The priority now is to further develop and professionalize the market to ensure it can cope with the expected growth of electric transport.**

### **Conclusion for 2018: charging station costs fall as revenues rises**

The cost for a standard charging station (3x25A, 2 sockets) are falling year-on-year, and while this decline continued in 2018 it was less steep than in preceding years. Total costs have come down, but one-off expenditure rose slightly from 3,110 euros in 2017 to 3,240 in 2018, partially as a result of the increased connection fees charged by the grid operator.

By contrast, periodic costs fell further this year from 580 to 510 euros annually. We can therefore conclude that while costs are continuing to go down over the economic life of the charging station, the rate of decline is beginning to level off.

On the revenue side, we observe an increase in use of public charging stations of approximately 15%, from 8.6 kWh to 9.9 kWh per day, equivalent to 3,600 kWh annually.

### **Forecast for 2025-2030: cost decrease continues to level off as usage increases**

Great strides have been made in recent years in reducing costs of charging stations. The 2018 Benchmark Report suggests there are unlikely to be further advances of such magnitude. Participants in the benchmark analysis indicate that they expect periodic costs to come down by around 15% in 2025-2030 – far less than the 25 to 30% fall in 2013-2018.

A similar dynamic can be observed in the anticipated 5% decrease in periodic costs, a stark contrast with the almost 40% achieved over the last few years. It would seem, then, that cost optimization has been achieved, and further optimization will come from innovative charging infrastructure solutions, such as charging hubs. New business models and functionalities will also become increasingly important.

Finally, on the revenue side the 2018 Benchmark Report forecasts a 50% rise in charging activity at charging stations, equivalent to approximately 15 kWh per day. <See table>

### **Maturity model identifies the challenges**

A standard charging station is still becoming cheaper, but the optimum level seems to have been reached. The priority now is to further develop and professionalize the market to ensure it can cope with the expected growth of electric transport.

Last year NKL introduced the Maturity Model for Electric Vehicle Public Charging Infrastructure, which uses nine categories to show the level of maturity of the current charging infrastructure market, and the level required by 2025-2030 to achieve a professionalized market. The conclusions form the basis for action points for professionalizing the market. The 2018 benchmark shows that in recent years initial steps have been taken. The optimization of charging infrastructure with respect to its installation and use is lagging behind, as is alignment with energy transition. In other categories, too, action points remain unresolved.

### **Further market professionalization is key**

The benchmark report shows that the market will have to be further professionalized in the coming years. A wide range of actions have been taken to raise the various levels of maturity. Benchmarking led to the identification of additional actions needed to ensure that a mature market is actually achieved. For example, it will be necessary to set up a standardized and speedy application procedure, perhaps in the form of an independent municipal application portal, since municipalities and EV drivers alike want rapid access to information on the available charging infrastructure. An independent application portal will facilitate the speedier placement/installation of charging stations on public roads.

There is an urgent need for sufficient personnel (particularly technical personnel) to accelerate the expansion of the charging infrastructure. In addition, to maximize synergy and benefit new business models increased attention should be paid to the interconnection of mobility, electricity and the built environment. Charging infrastructure links these domains, and is for this reason an important component of the Regional Energy Strategy. This constitutes an opportunity for the taking for local, provincial and national governments, knowledge institutes and market parties.

Additional action points for advancing a mature public charging market:

- Make use of strategic maps
- Establish a comprehensive nationwide network
- Conduct research into the inclusion of charging infrastructure in environmental legislation (NL: *Omgevingswet*)
- Involve EV drivers in projects, particularly technical projects
- Conduct research into potential consequences if the special tariff for energy tax lapses in 2020
- Assure price transparency
- Conduct research into price differential for home, work and public charging, for the advancement of EV adoption
- Perform cost-benefit analysis for smart charging
- Develop vision for smart charging (for optimization of charging infrastructure)

### **Benchmark action points in the National Agenda for Charging Infrastructure**

To ensure that the action points are actually taken up, the findings of the 2018 benchmark report were shared with the writing teams drafting the National Agenda for a Charging Infrastructure (NAL), which will be published in 2019. It will contain agreements about a large proportion of the action points from the benchmark analysis. The market, government, science sector and grid operators must therefore act together.

## Partners involved in the 2018 NKL Benchmark Report

National, provincial and municipal governments, market parties, knowledge institutions, energy suppliers and energy grid managers.

## Information and contact details

2018 NKL Benchmark Report (in Dutch): [Accelerating Progress to a Mature Market](#)

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Table: Results of public charging station cost/revenue update

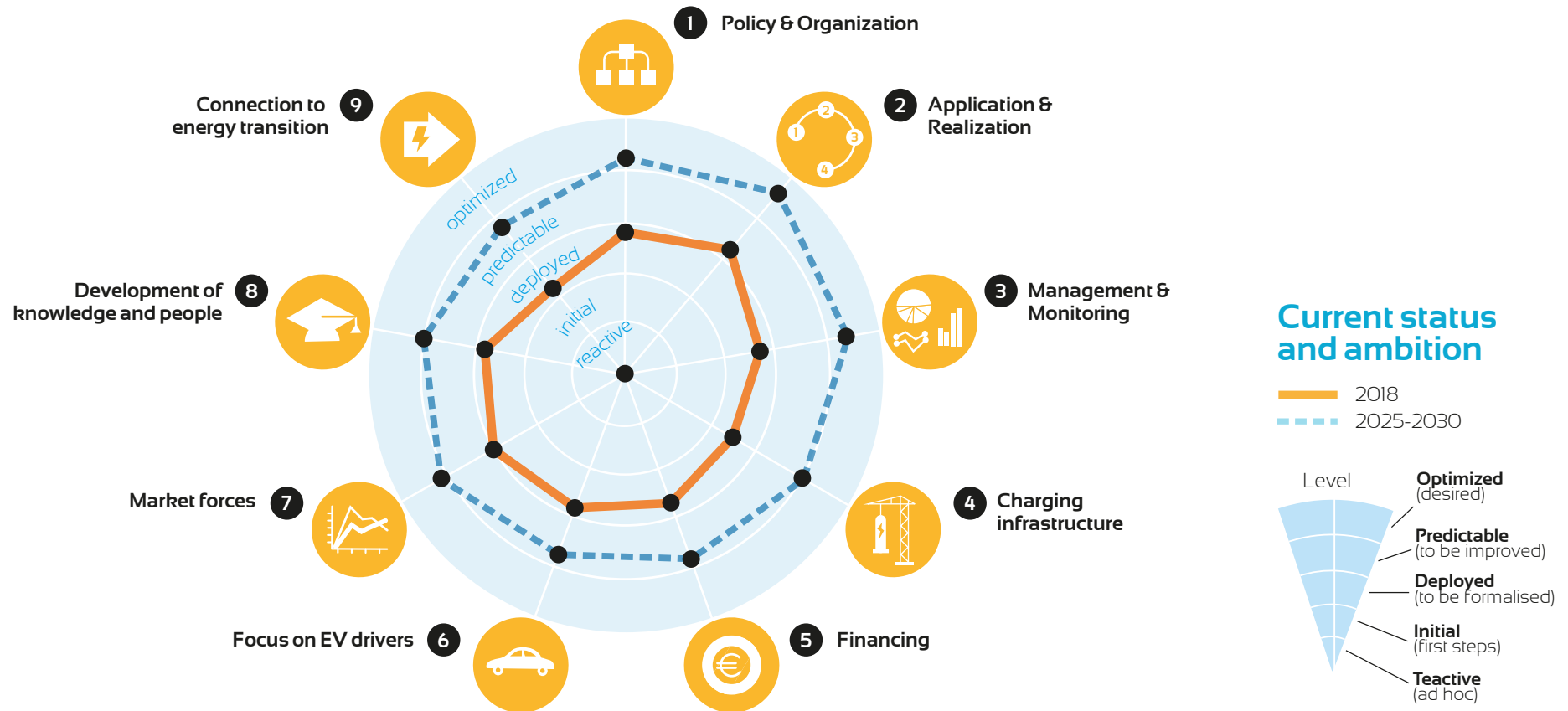
Category	Cost details	Benchmark 2013	Benchmark 2016	Benchmark 2017	Benchmark 2018	Forecast decrease 2025-2030
<b>Initial costs (Total)</b>	total	€ 4.655	€ 3.655	€ 3.110	€ 3.270	<b>15% decrease (approx.)</b>
Purchase price of charging station (3x25A, 2 sockets)	total	€ 2.000	€ 1.400	€ 1.330	€ 1.330	
Determining location	total	€ 700	€ 550	€ 320	€ 350	
Installation of parking space (location & signage)	total	€ 700	€ 450	€ 380	€ 450	
Grid operator connection costs	total	€ 655	€ 655	€ 690	€ 750	
Contractor's charges for station installation	total	€ 600	€ 600	€ 390	€ 390	

Category	Cost details	Benchmark 2013	Benchmark 2016	Benchmark 2017	Benchmark 2018	Forecast decrease 2025-2030
<b>Periodic costs excl energy</b>	annual	€ 835	€ 610	€ 580	€ 510	<b>5% decrease (approx.)</b>
Periodic charges for grid connection 3x25A	annual	€ 210	€ 210	€ 210	€ 190	
Communications	annual	€ 125	€ 75	€ 50	€ 70	
Insurance premium (damage)	annual	€ 25	€ 25	€ 25	€ 25	
Maintenance/Repairs	annual	€ 450	€ 275	€ 270	€ 190	
Service in the event of user problems	annual	€ 25	€ 25	€ 25	€ 35	

Category	Cost details	Benchmark 2013	Benchmark 2016	Benchmark 2017	Benchmark 2018	Forecast increase 2025-2030
Payment to supplier (purchase)	kWh	€ 0,06	€ 0,06	€ 0,06	€ 0,07	-
Energy tax	kWh	€ 0,10	€ 0,10	€ 0,05	€ 0,05	<b>100% increase</b>
Depreciation period	annual	5	7	9,2	9,2	-
Sales per kWh ex. VAT	kWh	€ 0,25	€ 0,28	€ 0,27	€ 0,25	-
Energy sales (kWh/day)	daily	5	8,5	8,6	9,9	<b>+/- 50% increase</b>

## Working towards a professional market

To cope with the expected growth of electric transport, the priority now is to further develop the Dutch EV market. The focus is changing from cost reduction to a professional market. The NKI EV Public Charging Benchmark 2018 formulates the most important action points.



- How is policy organized within the various municipalities/regions/provinces? To what degree is it integrated into other processes?
- How has the process of applying for and realizing a public charging point been arranged?
- How is management and monitoring of the public charging infrastructure carried out within the various municipalities/regions/provinces?
- How are public charging points being installed in the context of optimizing the charging infrastructure?
- To what degree is a competitive marketplace – one that does not rely on subsidies for installation, operation or innovation – present?
- Are the people driving EVs being taken into account?
- To what degree does an open and competitive marketplace exist?
- Will there be enough knowledge and people available to allow us to meet the projected targets for growth?
- Is the roll-out of charging infrastructure being sufficiently coordinated with the energy transition?










# The Netherlands Maturity Model Public Charging of Electric Vehicles 2018



Mature

Level

Just getting started

	 Policy & Organization	 Application & Realization	 Management & Monitoring	 Charging Infrastructure	 Financing	 Focus on EV drivers	 Market forces	 Development of knowledge and people	 Connection to energy transition
<b>5</b> optimized	<ul style="list-style-type: none"> <li>Clear-cut policy agreements at the municipal/regional levels</li> <li>Integration into processes and adjoining sectors</li> </ul>	<ul style="list-style-type: none"> <li>Integration into processes</li> <li>Predictable, short processing times</li> <li>Pro-active and systematic approach</li> <li>Application and registration coordinated between parties</li> </ul>	<ul style="list-style-type: none"> <li>Operationally efficient and effective</li> <li>Info for better use of charging infra</li> <li>Independent of any one party</li> <li>Long(er)-term centralized management agreements</li> </ul>	<ul style="list-style-type: none"> <li>Predictable delivery/surplus</li> <li>Insight into flexible charging at connection level and tailored to specific energy system</li> </ul>	<ul style="list-style-type: none"> <li>Maximum efficiency</li> <li>Use revenue to finance innovation</li> <li>Insight into fixed costs versus additional services</li> <li>Transparent cost structure</li> </ul>	<ul style="list-style-type: none"> <li>Prioritize customer experience and customer satisfaction</li> <li>Services are independent of CPO/MSP (for ex.: real-time insight into location, rates and availability)</li> <li>Customer interaction aimed at product improvement</li> </ul>	<ul style="list-style-type: none"> <li>Open market with new entrants and innovations</li> <li>Healthy business models with distinctive propositions</li> <li>Investors maintain long-term involvement</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient knowledge and experience to facilitate growth of charging infra</li> <li>Guarantee continuity within the team</li> <li>Regular internal knowledge-sharing</li> </ul>	<ul style="list-style-type: none"> <li>Developments related to charging infrastructure are integral part of energy transition</li> <li>Coordinated approach</li> </ul>
<b>4</b> predictable									
<b>3</b> deployed	<ul style="list-style-type: none"> <li>Policy at the municipal level</li> <li>Discussion and coordination with chain partners</li> <li>Basic agreements</li> </ul>	<ul style="list-style-type: none"> <li>Predictable process for municipalities</li> <li>Quantify but not guide processing time</li> <li>Each party has own system</li> <li>Limited integration with chain partners</li> </ul>	<ul style="list-style-type: none"> <li>Involved parties set requirements</li> <li>Limited coordination of and approach to implementation &amp; management</li> <li>Limited reporting across entire charging infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Local initiatives for balancing/ coordinating grid congestion and voltage issues</li> <li>Identify bottlenecks at neighborhood/street level</li> </ul>	<ul style="list-style-type: none"> <li>Some market segments profitable without subsidies</li> <li>Subsidize/incentivize needed investments</li> <li>Insight into costs of the value chain</li> </ul>	<ul style="list-style-type: none"> <li>Focus market parties on customer perception</li> <li>Reliable insight into costs/location of each CPO</li> <li>Development of specific services</li> </ul>	<ul style="list-style-type: none"> <li>Market parties and earnings models aimed at existing market roles</li> <li>Market not yet transparent and suitable for comparison</li> </ul>	<ul style="list-style-type: none"> <li>Staffing usually sufficient</li> <li>Some knowledge and experience among a small group of people</li> </ul>	<ul style="list-style-type: none"> <li>Charging infrastructure is area for attention during energy transition</li> <li>Limited coordination with other sectors; is primarily focused on practical issues/problems</li> </ul>
<b>2</b> initial	<ul style="list-style-type: none"> <li>Responsibility lies with municipalities</li> </ul>							<ul style="list-style-type: none"> <li>Personal involvement and expertise determine progress</li> </ul>	
<b>1</b> reactive	<ul style="list-style-type: none"> <li>No policy in place</li> <li>Ad hoc decisions by stakeholders</li> <li>Inconsistent solutions</li> </ul>	<ul style="list-style-type: none"> <li>Reactive</li> <li>Applications reviewed ad hoc</li> <li>No dedicated process or system</li> </ul>	<ul style="list-style-type: none"> <li>Lacks coordination</li> <li>Charging points managed individually</li> </ul>	<ul style="list-style-type: none"> <li>Social necessity is leading for placement</li> <li>No optimization of electricity consumption/delivery</li> </ul>	<ul style="list-style-type: none"> <li>Charging infrastructure developing by means of subsidies and incentives</li> </ul>	<ul style="list-style-type: none"> <li>No clear focus on customer experience and perception</li> <li>Focus on energy transition and technology</li> </ul>	<ul style="list-style-type: none"> <li>Regulated non-profits dominate the market</li> <li>Social necessity is guiding implementation</li> </ul>	<ul style="list-style-type: none"> <li>No responsibilities specified</li> <li>Hardly any knowledge/expertise present</li> </ul>	<ul style="list-style-type: none"> <li>No coordination/consultation between charging infrastructure and other sectors involved in energy transition</li> </ul>