



Ole esimeste seas!
TEEL TULEVIKKU

ELMO quick charging network

How to develop
nationwide charging
network?

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Topics

- Background
- Planning
- Locations
- Business model
- Preparation and Installation
- Launch and results

BACKGROUND



- Started in March 2011
- Fully financed by CO2 quota sales to the Mitsubishi Corporation
- Implemented by the Ministry of Economic Affairs and Communications
- Implementation agency: KredEx

ELMO program

**Advanced
charging
infrastructure**

**Competence
centers**

EV Grants

Car sharing

**Demo &
Awareness
raising**



THE PLANNING PHASE

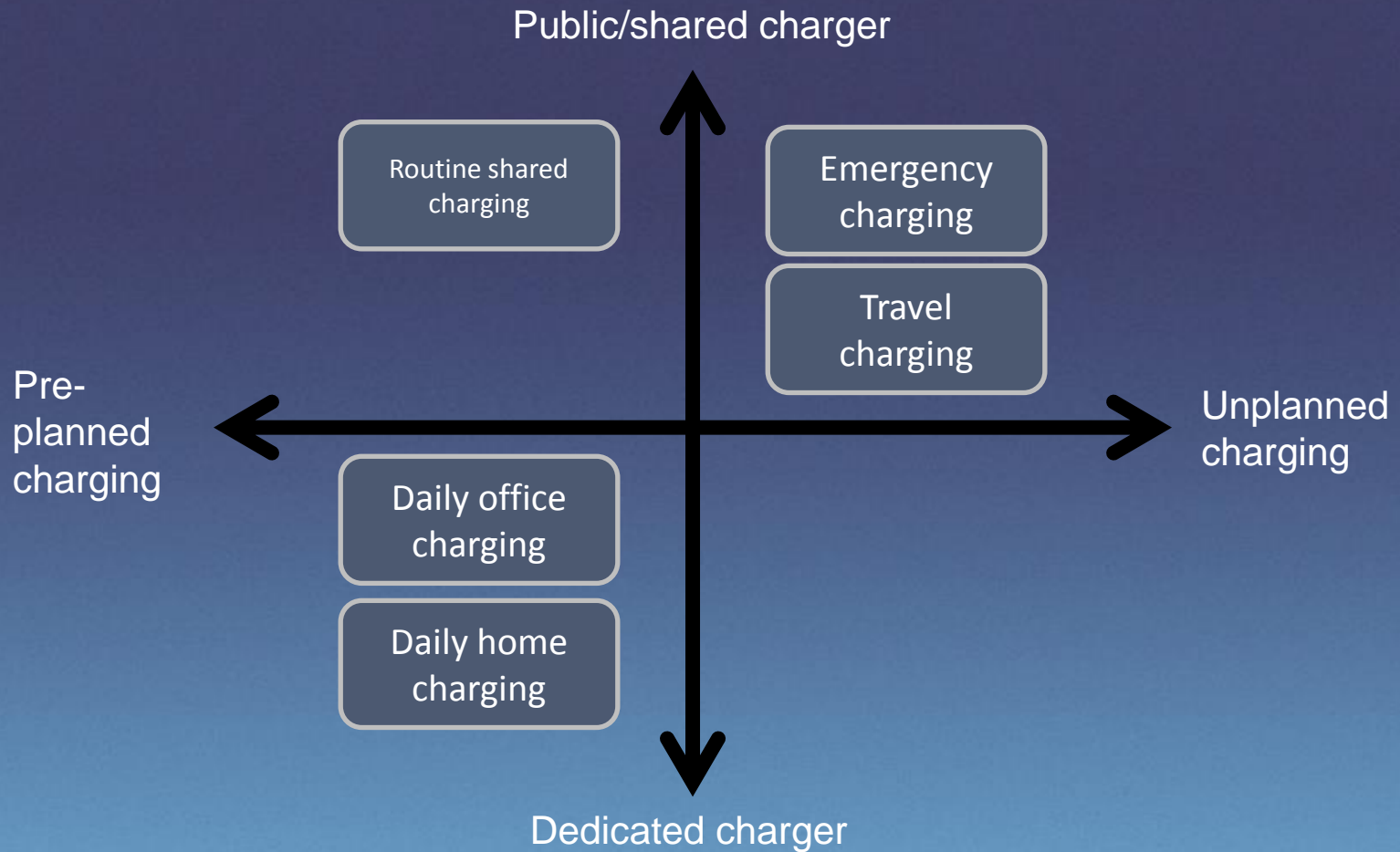
Planning: March – July 2011

- What are the use cases for various needs for recharging the EV?
- What are the charging technology choices?
- What are the expectations for the service?
- What kind of IT infrastructure we need?
- Where should we put those chargers?
- **How to complete the project in 18 months?**

Principal decisions

- It's going to be a “public safety network” to address range anxiety
- We go for single operator/centrally managed business structure for the country wide network
- We procure the full solution, including the service, from single consortium – minimizes the risks of technological incompatibilities

Possible charging use cases



3 main use-cases for the ELMO charging network

Emergency charging

- Locations hard to predict
- Cover the main routes

Shared routine charging

- Locations easy to predict
- Follow the daily routines

Travel charging

- Locations easier to predict
- Emphasize tourist routes

Use cases and technology options

	AC Normal 6-8h	AC Fast 1-2h	DC superfast 20-30min
Daily office charging	OK	Maybe	Not OK
Daily home charging	OK	Maybe	Not OK
Routine shared charging	Maybe	Maybe	OK
Emergency charging	Not OK	Maybe	OK
Travel charging	Not ok	OK	OK

It takes time to plan the network

It took roughly one year to be ready for the actual building works



LOCATIONS

LOCATION IS EVERYTHING!

- Well, almost 😊
- Why the locations are important?
 - Hard to secure them
 - Difficult to change them later
 - Your business is directly dependent on whether you hit the right spot in city or road
- **Problem: nothing to rely on, because you cannot count on the existing traffic data too much, battery vehicles are just too different.**

We created some simple rules

- No more than 50-60 km between quick chargers in main roads
- 1 quick charger for towns with more than 3000 inhabitants
 - Almost all Estonian towns, because somebody drives an EV there someday soon
- Ca 1 quick charger per 10 000 inhabitant in cities with more than 10 000 inhabitant
 - Because there is statistical chance that somebody buys an EV there

BUSINESS MODEL

Operating model

Services

Private operator, selected by **KredEx** for 5 years

Charger control and maintenance

Business services

Customer support

Security services

Asset management

KredEx selected private operator to run the charging network for 5 years. Operator will receive a service fee for the operation. No profit from energy sales during initial 5 years.

Assets

Owned by **KredEx**

Quick chargers

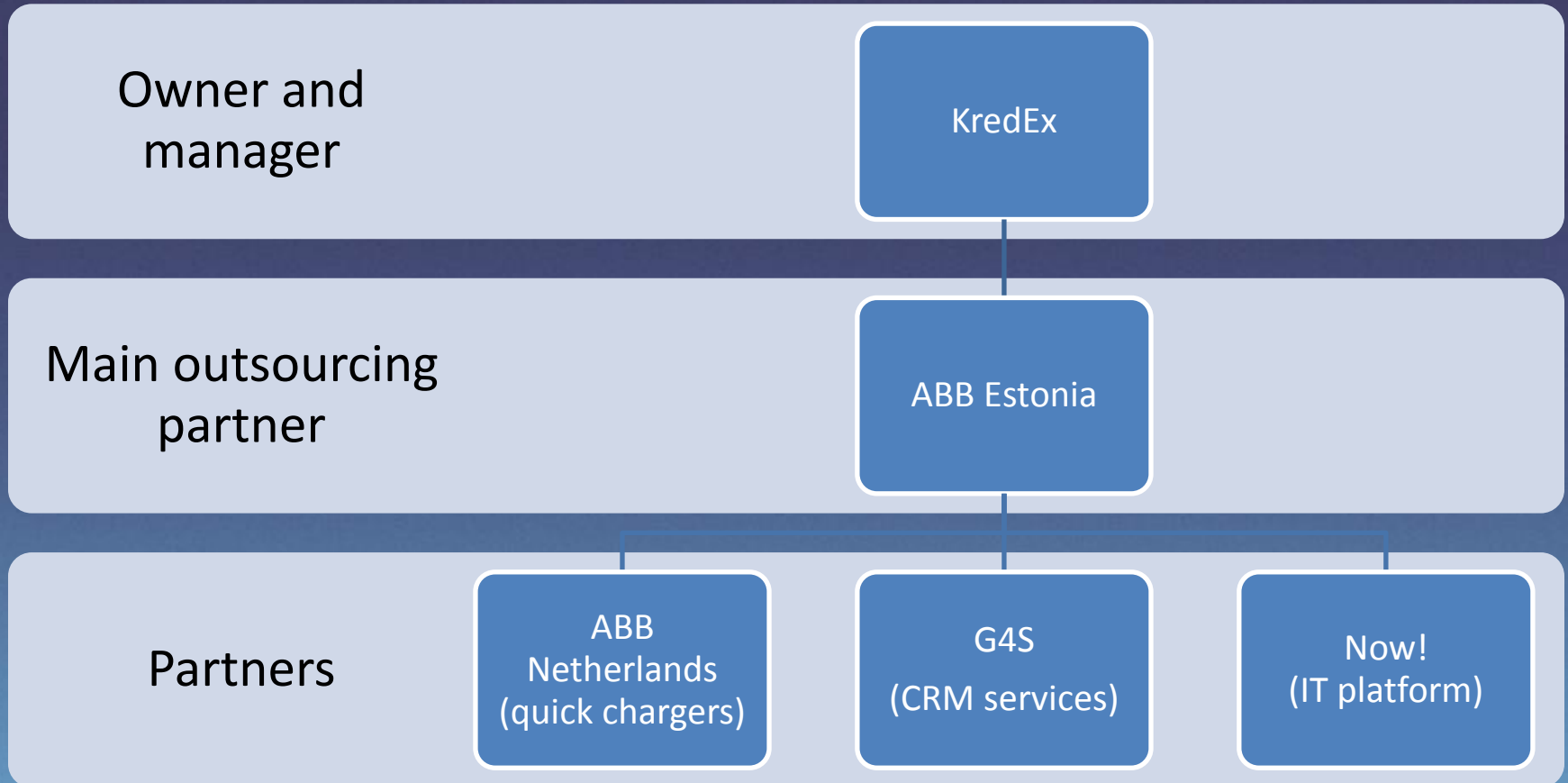
Network management system

Locations for chargers

High power grid connections

Intellectual property

Business structure



Pricing

	FLEX	Combi	Volume
Monthly fee	0 EUR	10 EUR	30 EUR
Pay per charge	5 EUR	2,5 EUR	0 EUR
Limits	No limits	No limits	150kWh/ month 1,2EUR per charge after that

PREPARATION AND INSTALLATIONS

The real action

- We had two separate companies to do the real work
 - **Elektritsentrum** with multiple teams to prepare the locations (groundworks, cables from connection points, foundations for QCs)
 - **ABB** with multiple teams to install and set up the chargers
- Amazing speed of deployment
 - We started building the locations in September 2012
 - The network was completed by the end of January 2013 (with some chargers to be added in spring)

Behind the scenes (last 3 months)

- Training of the customer support teams
- Development of business routines
- Analysing early statistics to model pricing packages
- Signing the electricity purchase contracts
- Developing the legal side of the service
- Setting up the pricing solutions
- Testing IT background
- Managing media relations
- Informing the possible customers of network status
- Etc etc

LAUNCH AND RESULTS

Launch plan

- Gradual launch – commission the charger ASAP
- Free charging until the end of January
- Introduction of future pricing schemes in late November
- Customers were able to sign the contracts since December
- Early January we switched to “authentication mode”
- Since February charging is not free anymore
- **Big party coming in 20th February in Tallinn!**

The largest quick charging network in Europe

Quick facts

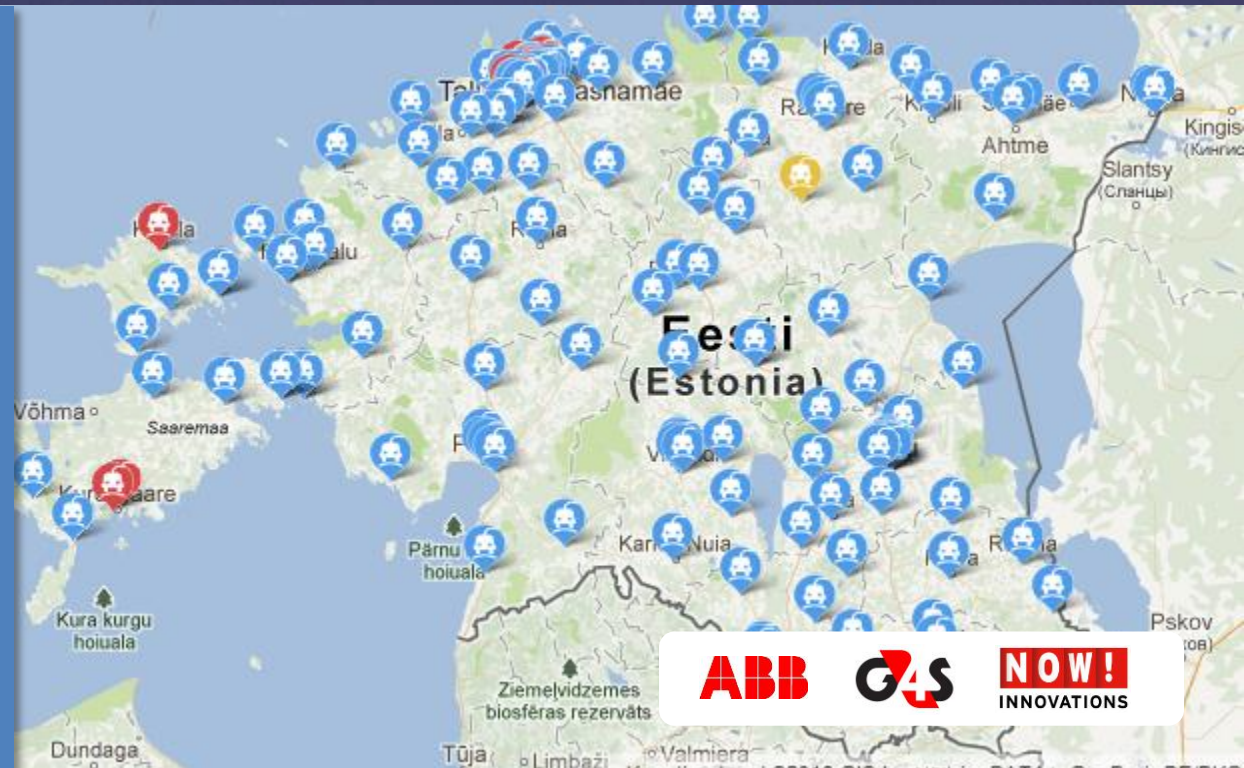
Project start: June 2011

Installation start: June 2012

Quick chargers working: 151

Total number: 165

Operated by ABB, G4S and
Now! Innovations



ABB

G4S

NOW!
INNOVATIONS

DC fast charging infrastructure development in Europe

- Weird island in the upper right corner of Europe 😊
- We had no idea, that this is how Europe will look like in 2013.



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Questions and answers

THANK YOU!

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