

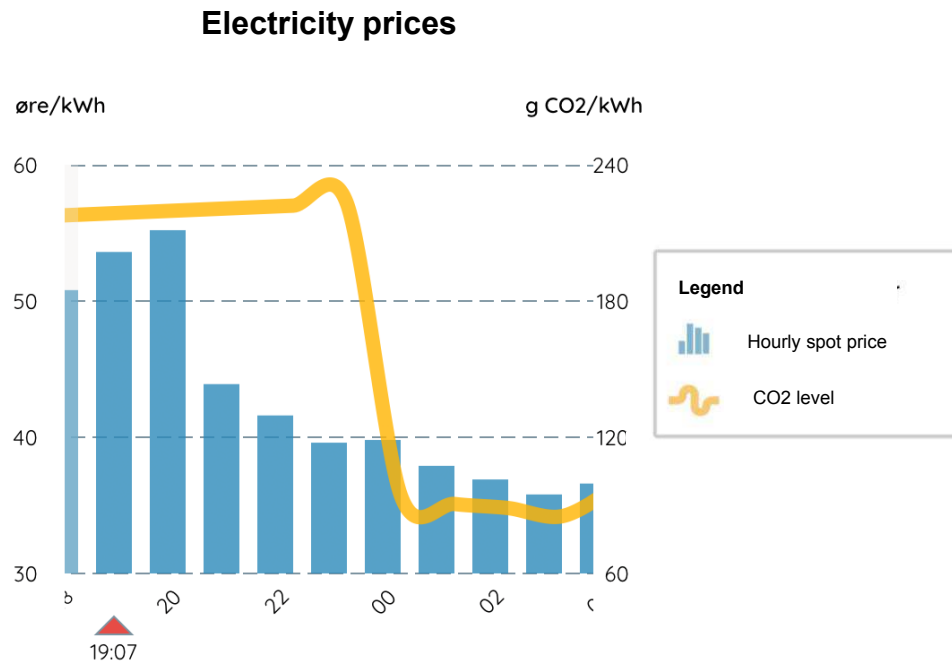
true Energy

Løsningerne findes allerede i dag:
Med True Energy kan elnettet klare mange
flere elbiler med færre investeringer i
infrastruktur, og fremtidens elforbrug kan
baseres på vedvarende energi



The electricity market in EU:

- ✓ Electricity prices and CO2 levels are changing every hour
- ✓ They are fixed 24 hours ahead



Question: “How do I remember to consume electricity when it’s climate-friendly and cheap?”

Our answer: “You don’t - you forget... That’s why we have created True Energy to do it for you”

We are helping customers to automatically consume electricity when it’s climate-friendly and cheaper



True Energy is:

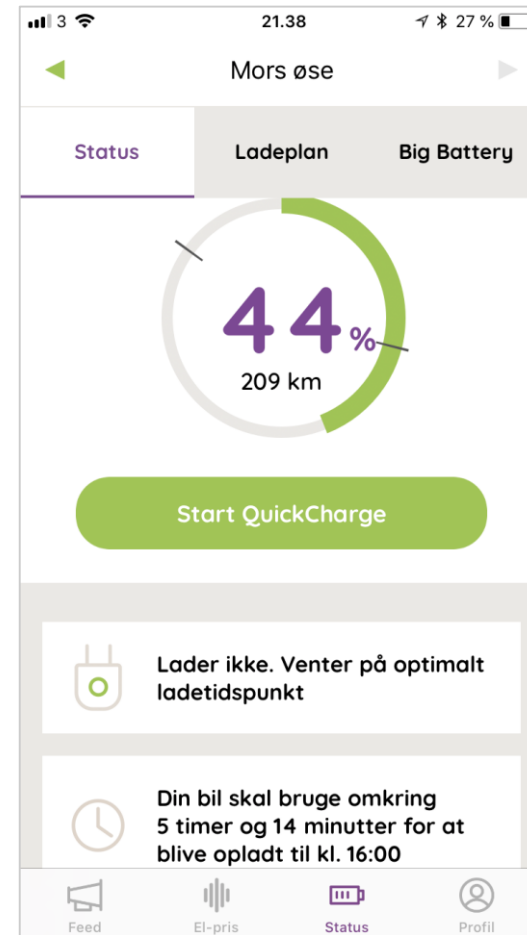
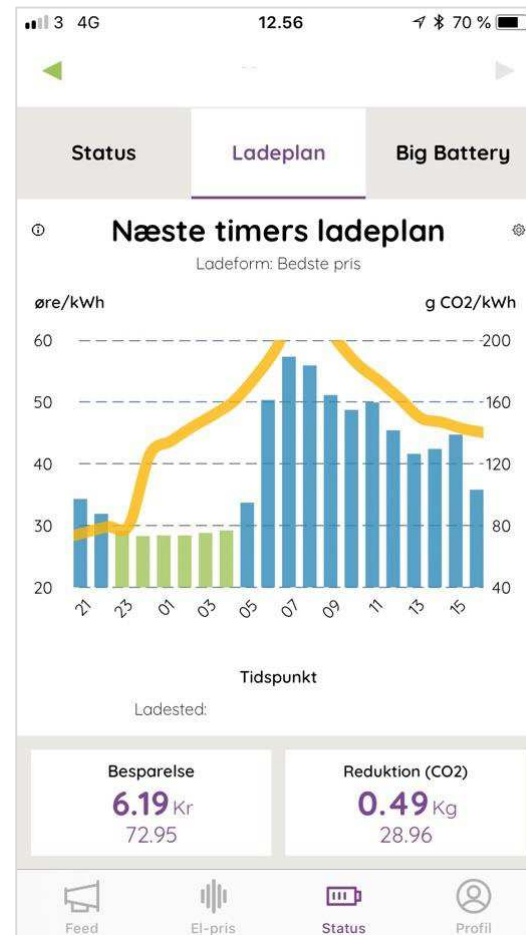
- ✓ Danish independent company founded by Charlotte Sand in 2018
- ✓ Certified electricity supplier
- ✓ Providing digital solutions since August 2018 in Denmark

kan din **elbil** blive mere **miljøvenlig?**



App with **Smart Charge** of all EVs

Automatic charging of EVs during the hours with most climate-friendly and cheapest electricity

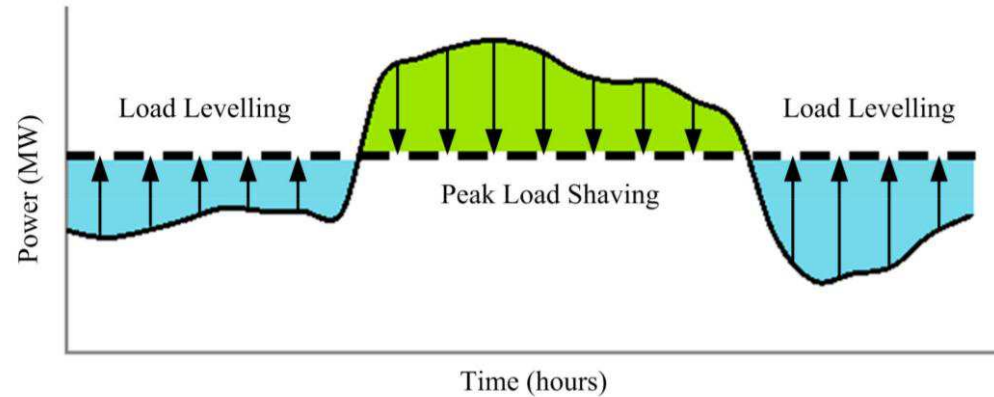
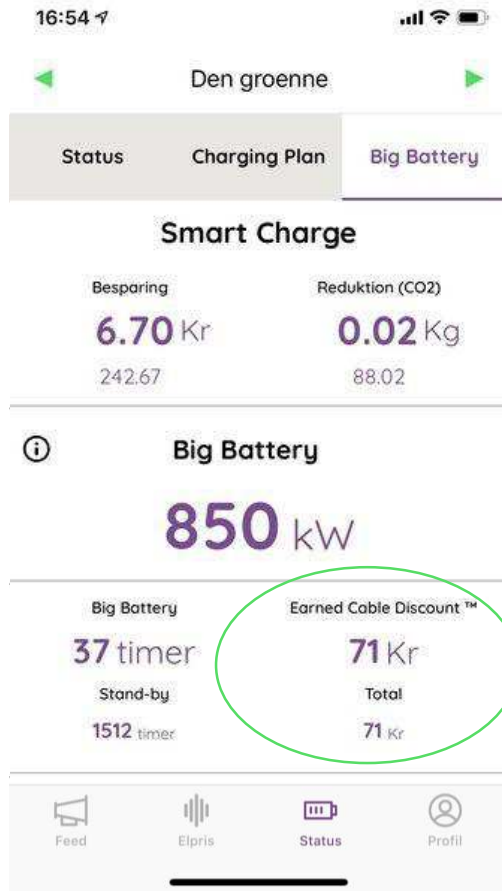


- ✓ App integrates with EV through car API
- ✓ The users' personal preferences are set in the app
- ✓ True Energy calculates the optimal charging plan
- ✓ The app shows charging plan and current status
- ✓ Saving potential: at least 5% of EV electricity cost and CO2
- ✓ Translated to five languages and prepared for more
- ✓ Available since August 2018:



True Energy aggregates

EV batteries to a **demand respons** system delivered to TSOs



- ✓ True Energy aggregates many EV batteries.
- ✓ By starting and stopping charging the batteries work as a “Big Battery” that provides frequency regulation to the national electricity grid.
- ✓ Energinet the Danish TSO pays True Energy for the balancing services.
- ✓ Discount potential for customers: 5% of EV electricity cost.

- ✓ The TSO pays True Energy for balancing the grid (FCR)
- ✓ The payment is shared with the car owners as Cable Discount
- ✓ Cable Discount is provided as a reduction on the car owner’s electricity bill



APPROVED BY THE DANISH TSO (ENERGINET)

True Energy helps the entire household to **automatically** consume electricity when it's climate-friendly and cheaper

Control the Home Appliances

Everyday gadgets and household devices are increasingly getting online. In 7 years all home appliances in your house will be online. With our Smart Home product we can start your Dishwasher when electricity is optimal.

 Smart Home

IFTTT



Control the EV Cars & their batteries

EVs is the biggest and most flexible electricity consumer in the household. The battery in the EV can be leveraged in multiple way in our products.

 SmartCharge

 Big Battery



Electricity aggregator

True Energy is an approved participant in the Danish TSO's System reserve capacity planning. All electricity approvals in place.

 Electricity supplier

 Certified reserve capacity

Solar & Battery

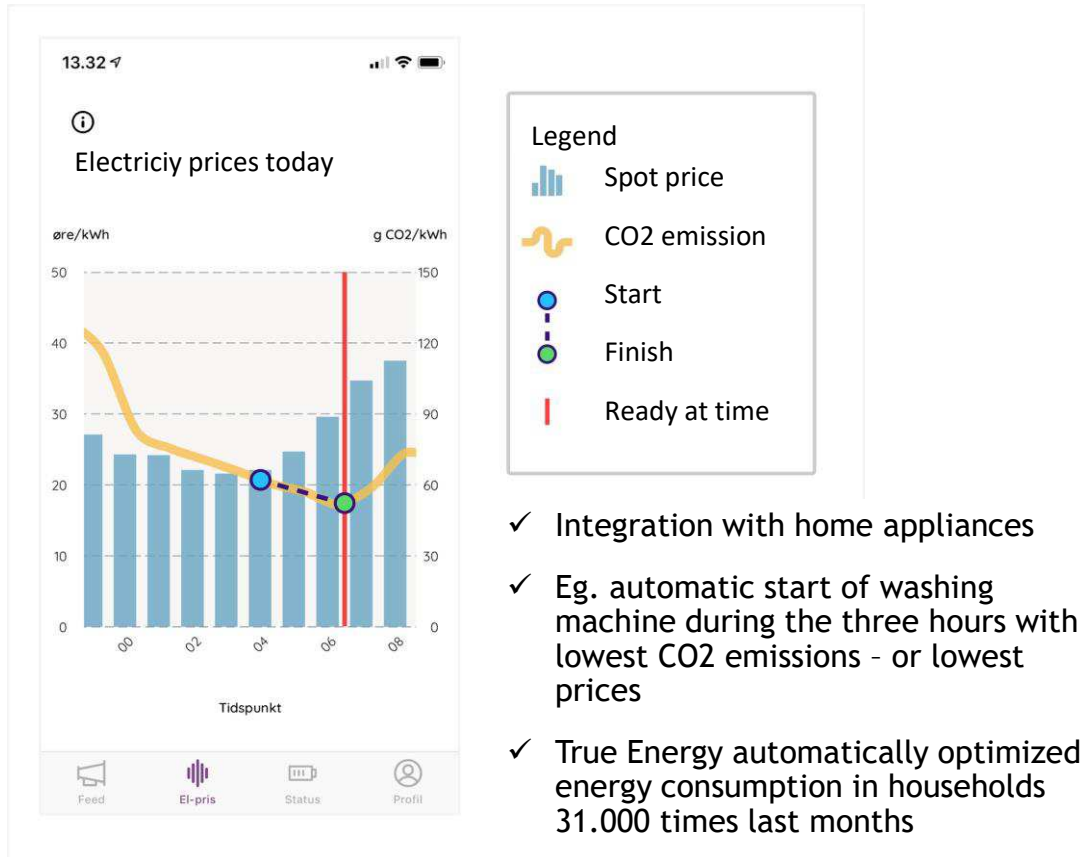
Real time energy management for PV owners optimizing electricity consumption behind the meter.

 TrueX

Control the HVAC

In SmartHeating 1.0 we are ready to control TADO, NEST and IntensisHome.




True Energy also provides **Smart Home** solutions for more than 628 hardware brands






True Energy HVAC




True Energy will provide optimization of the electricity consumption of HVAC devices offering the customer automatic savings of carbon emission or money




Set Tado thermostat a bit warmer when electricity cheap & climate friendly
by True Energy Smart Home 
works with 


Reduce Nest temperature a bit when electricity expensive or CO2 levels high
by True Energy Smart Home 
works with 


Set heat pump temperature a bit warmer when electricity cheap & climate friendly
by True Energy Smart Home 
works with 

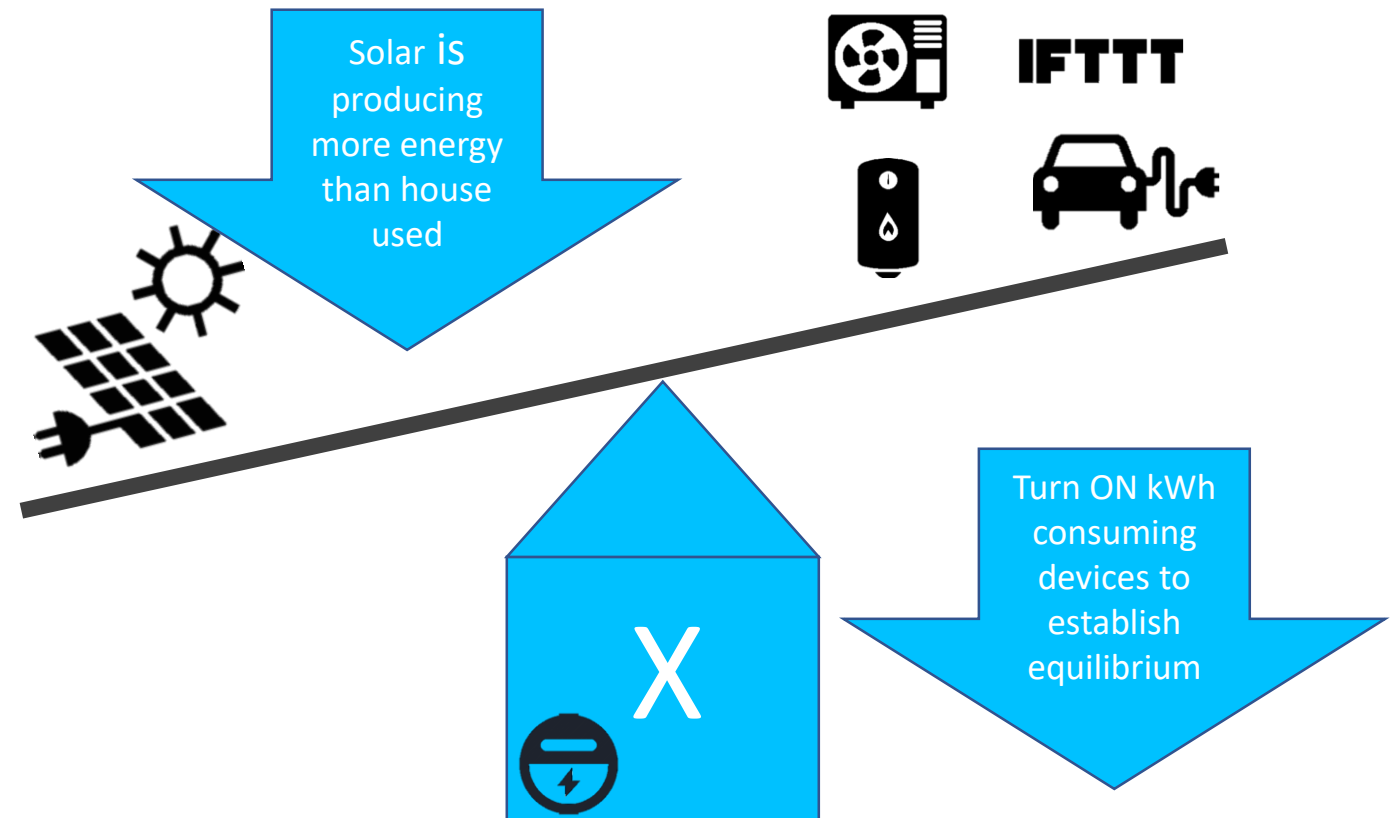

Set Freezer temperature a bit cooler when electricity cheap & climate friendly
by True Energy Smart Home 
works with 

- True Energy's app integrates with HVAC systems/devices like electrical heaters, floor heating systems, air con systems, freezers etc.
- The users' personal preferences including comfort levels are set in the app.
- True Energy calculates the optimal consumption plans based on daily electricity prices, CO2 forecasts, personal preferences and the abilities of the device.
- E.g. when electricity has low CO2 emission or is cheap the house will be heated to a few more degrees. During hours with black or expensive electricity the house will not need to be heated - hence saving CO2 and money.

TrueX

Balancing solar cell production and home consumption **behind the meter**

- TrueX will do microgrid - behind the meter - balancing.
- When there is a surplus of energy due to solar cells producing more energy than used - True Energy's TrueX will turn on power consuming devices in the house to establish equilibrium...and vice versa.



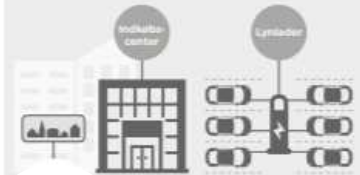
True Energy's Big Battery handles sudden production/demand imbalances.



TSO:
National grid
[Energinet]

DSOs are responsible for local grids. They face increasingly pressure on **capacity** (eg. cables and transformers) due to increased number of EVs, electrical heating etc.

DSO [Netselskaber]



Cities



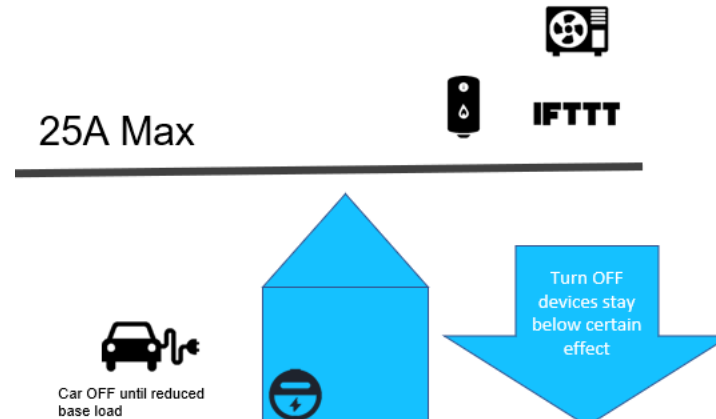
Residential



Solutions:

- Substantial asset investment \$\$\$
- **Flexible demand** so peaks are avoided

TrueMaX - real time peak control for **decentral** grid owners [Netselskaber]



TrueMaX can replace some of the investment in new assets:
TrueMaX turns OFF access to major or minor energy consumer devices in order to stay under a certain effect being drawn from the main power lines.

E.g. Everybody starts cooking: Then EV's charging is paused.

Can be applied to a single household, a street, a parking lot, a city block or city borough to reduce the local bottleneck.

Benefits:

- Lower cost of Amps for landlords and EV owners
- Reduces drain on transformers and peaks
- Can be grouped by communities

DSO benefits:

- Postpone grid expansion
- Orchestrate consumption without heavy customer investments

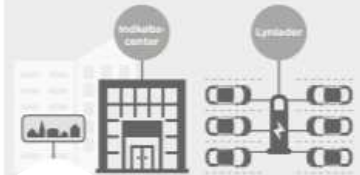
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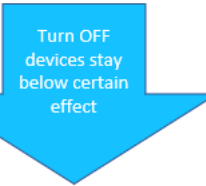
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TrueMaX - real time peak control for **decentral** grid owners (Netselskaber)

25A Max



Car OFF until reduced base load



It's dinner time: Everybody starts cooking. It's also getting colder, so electrical heating pumps are starting. Now that's too much effect being drawn from the power lines: They will soon collapse! Before collapsing, True Energy's service stops the three EV's that were also charging. The EV's will charge later (there is plenty of time and free power line capacity during the night). And the power lines remain running with enough electricity for cooking and heating.

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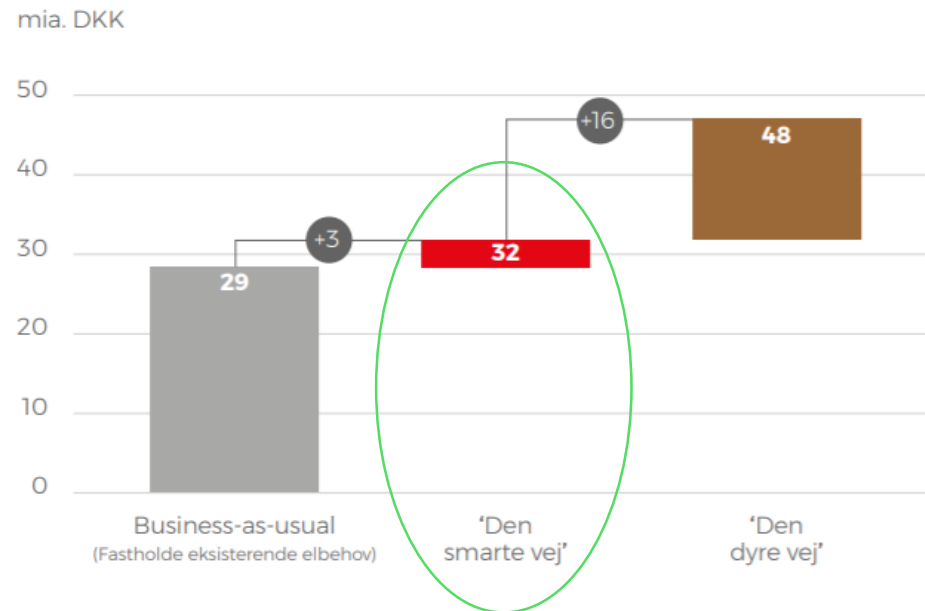
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- Orchestrate consumption without heavy customer investments

True Energy's SmartCharge, Big Battery and TrueMaX contribute to "Den Smarte Vej"

as recommended by Dansk Energi in order to prepare the Danish electricity grid for one million EVs

Figur 3. Samlet investeringsbehov i eldistributionsnettet, 2019-2030

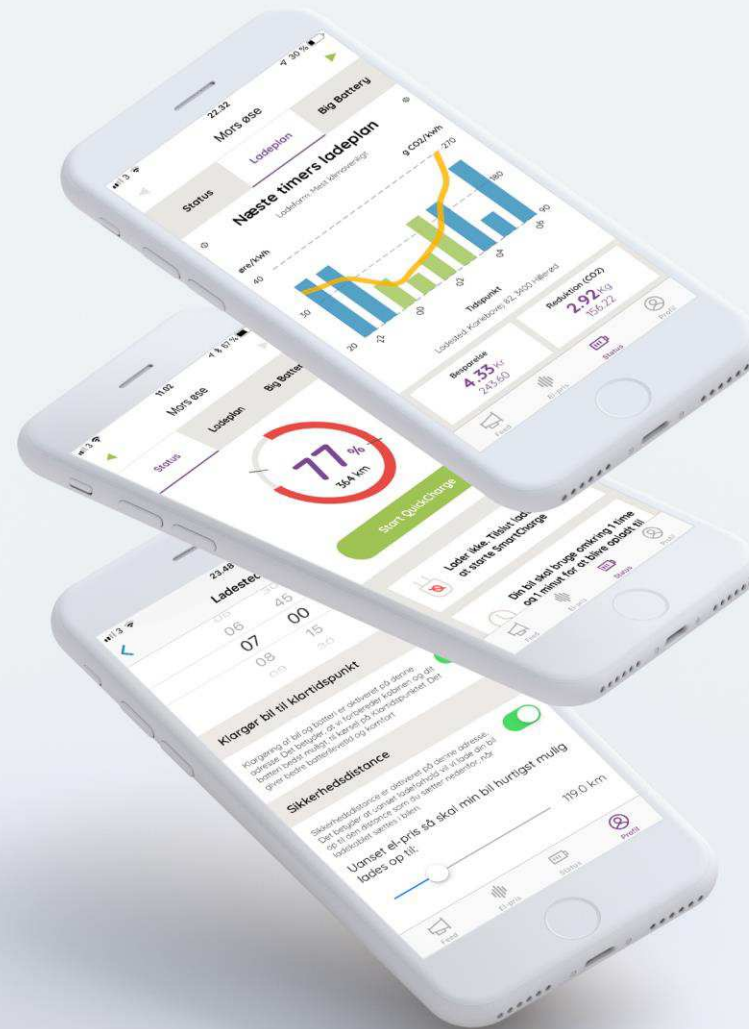


Det vil kræve investeringer for 29 mia. kr. af elnetselskaberne frem mod 2030 alene for at sikre, at elnettet kan levere samme elbehov som i dag med samme leverings-sikkerhed.

Beløbet stiger til hhv. 32 mia. kr. eller 48 mia. kr. med ankomsten af én mio. grønne biler i 2030, afhængig af om man politisk vælger den 'smarte' eller 'dyre' vej.

https://www.danskenergi.dk/sites/danskenergi.dk/files/media/dokumenter/2019-05/Elbilerne_kommer_gor_elnettet_klart_til_elbilerne.pdf

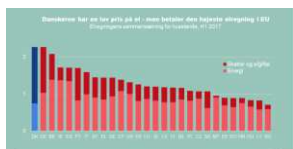
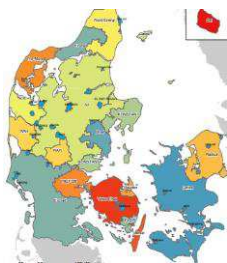
intelligent
klimavenligt
smart



Ønskeliste

True
Energy

Ønskeliste



Udfordring	Konsekvens	Løsning	Fordele
<ul style="list-style-type: none"> ☀️ Stram lovgivning medfører, at Netselskaber ikke kan købe balance/ fleksibilitet 	<ul style="list-style-type: none"> ☁️ Der udvikles og tilbydes ikke balance-ydelser til DSO'er, og de skal investere mere i kabler, transformers mm. 	<ul style="list-style-type: none"> ▶ Udvikle rammebetingelser så netselskaber kan købe balanceydelser 	<ul style="list-style-type: none"> ★ Elnettet udvikles til at kunne rumme 1 mio elbiler, varmepumper mm langt billigere end det er at etablere ny infrastruktur
<ul style="list-style-type: none"> ☀️ Høje danske el-afgifter betyder det ikke kan betale sig at ændre adfærd 	<ul style="list-style-type: none"> ☁️ El er dyrt sammenlignet med andre lande og forsinker overgangen til mere eldrevet forbrug 	<ul style="list-style-type: none"> ▶ Sænke el-afgifter 	<ul style="list-style-type: none"> ★ El-biler, varmepumper mm bliver billigere i drift og flere vil overgå til el fremfor fossil energi til opvarmning og transport.
<ul style="list-style-type: none"> ☀️ Elleverancer behandles som selvstændigt produkt pålagt leveringspligt 	<ul style="list-style-type: none"> ☁️ Produktudvikling af energy-as-a-service løsninger, fx varme, transport og energioptimering er hæmmet af skrappe regler for prissætning og fakturering af el som selvstændigt produkt 	<ul style="list-style-type: none"> ▶ Indfør nye regler for energy-as-service løsninger og afskaf leveringspligt 	<ul style="list-style-type: none"> ★ Flere (nye) virksomheder vil innovere på energy-as-service løsninger ★ Kunderne vil blive langt mere bevidste om værdien af energi som service ★ Produkter vil kunne blive designet målrettet til de enkelte kunders behov
<ul style="list-style-type: none"> ☀️ Ændringer og diskussioner vedr. afgifter på el-biler og strøm til opladning 	<ul style="list-style-type: none"> ☁️ Enhver tvivl og usikkerhed udskyder beslutninger og salg og dermed omstilling til flere el-biler 	<ul style="list-style-type: none"> ▶ Langsigtede aftaler fx rullende 10 år 	<ul style="list-style-type: none"> ★ Flere tør købe den første el-bil. ★ Flere virksomheder investerer i udvikling af intelligente løsninger.

Contact

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We participate in PowerGen in Paris

