EV FLEXIBILITY WITH RADIUS

Charlotte Sand, CEO & Founder
March 28, 2022

7 AFFORDABLE AND CLEAN ENERGY
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION

true

AGENDA

- True Energy’s system
- Learnings
- Perspectives

SYSTEM

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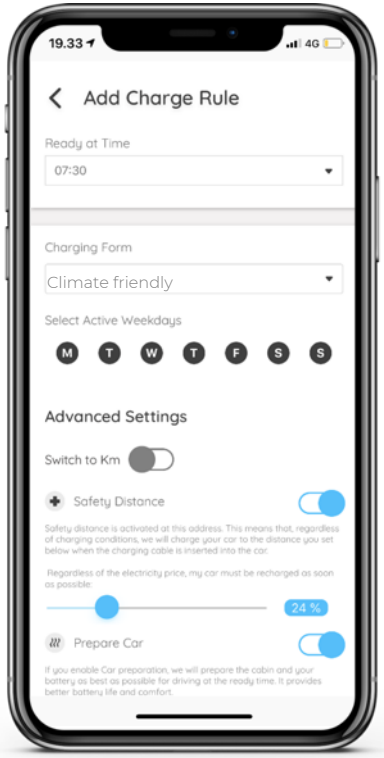
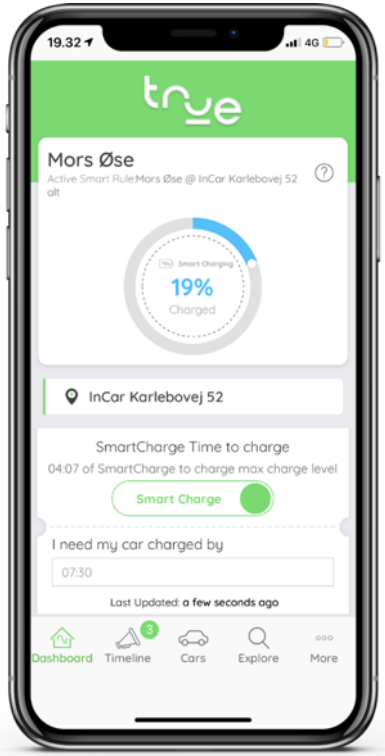
PREREQUISITE: SMART CHARGE YOUR EV WITH TRUE ENERGY APP



PERSONAL PREFERENCES

CHARGE PLAN



STATE OF CHARGE

EV OWNERS SAVE MONEY & CO2

SET & FORGET

WE SUPPORT EVERY CAR BRAND and MODEL

TESLA

easee

CHARGE AMPS

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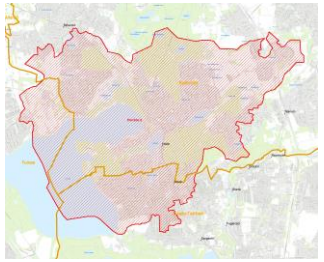
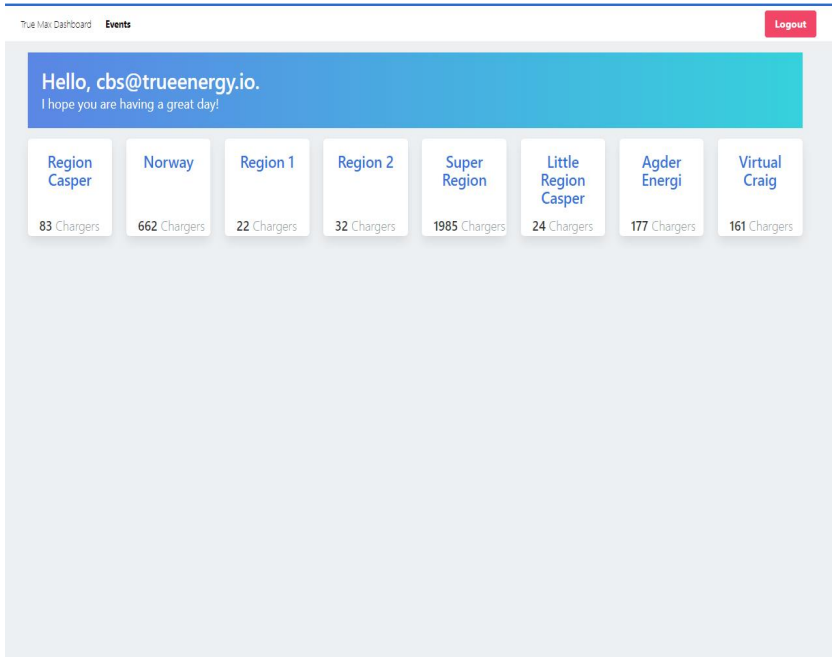
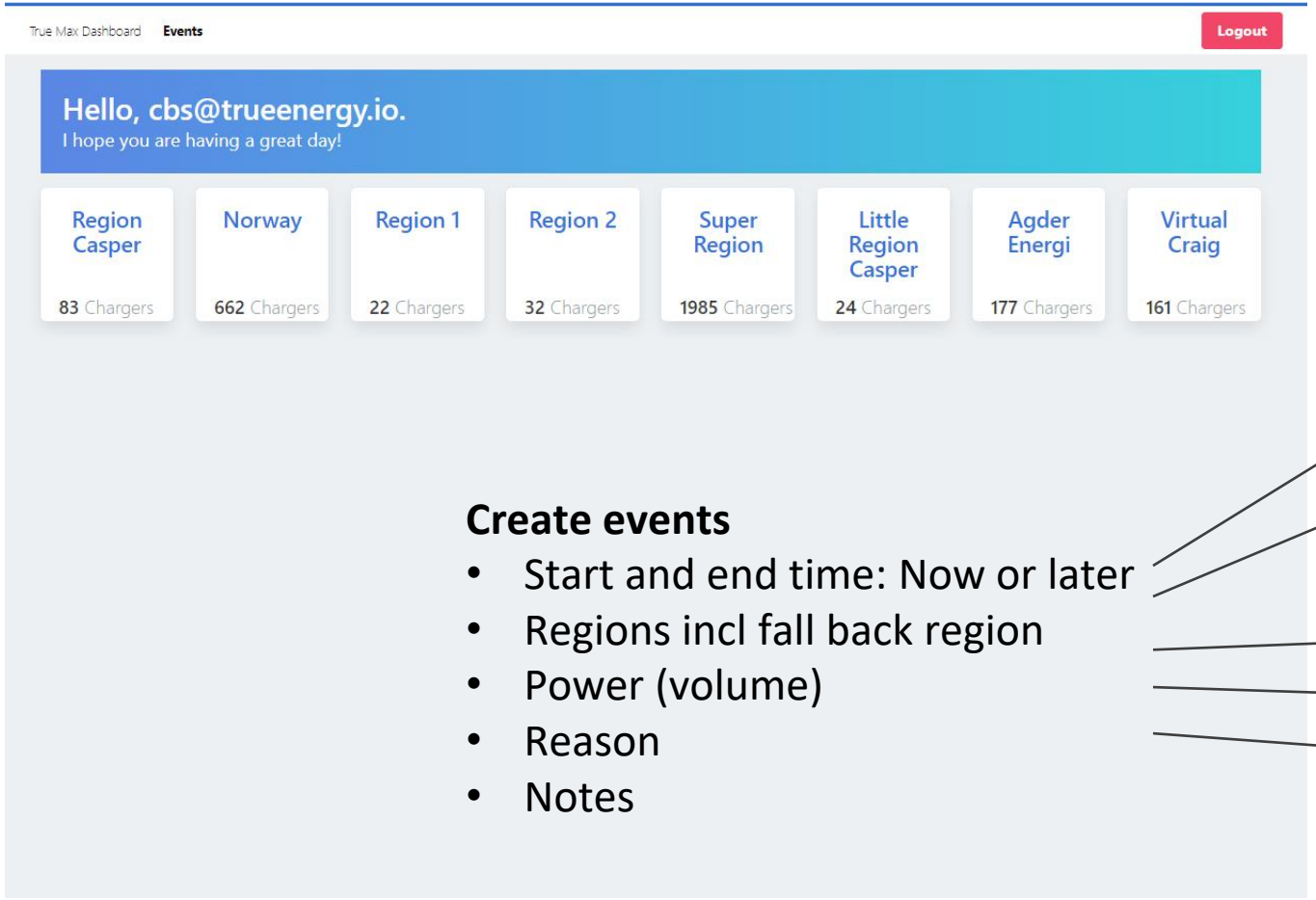
REGIONS

- DSO provides data about relevant areas/regions
- Regions created in system



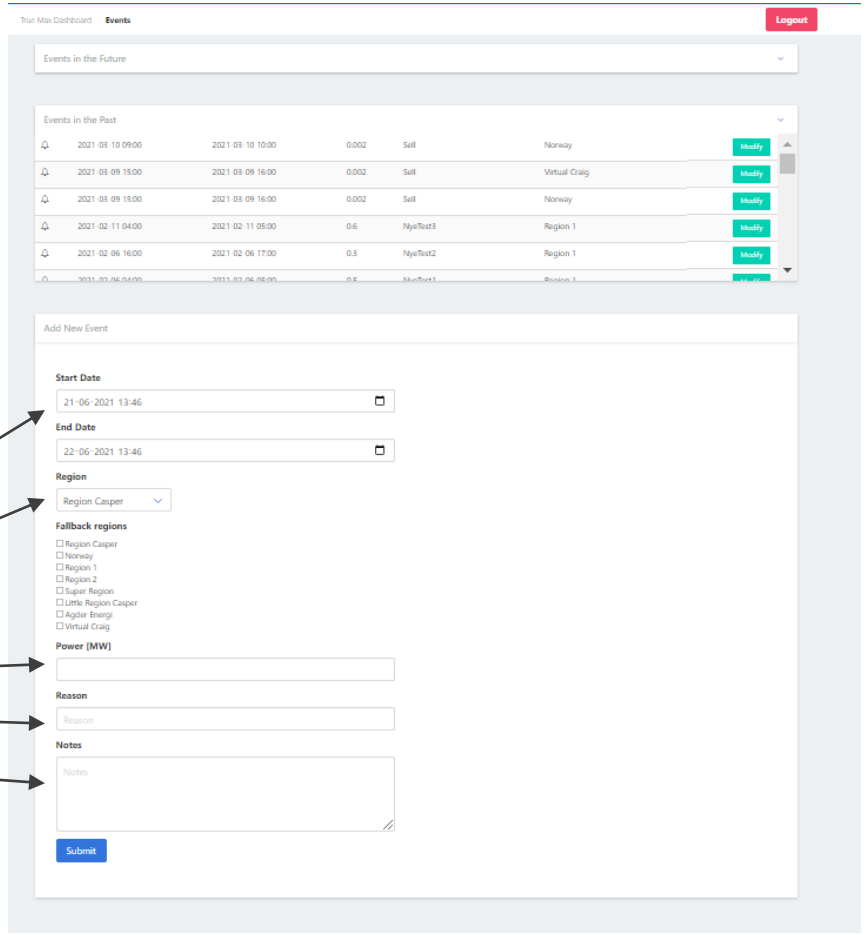


OPERATOR DASHBOARD



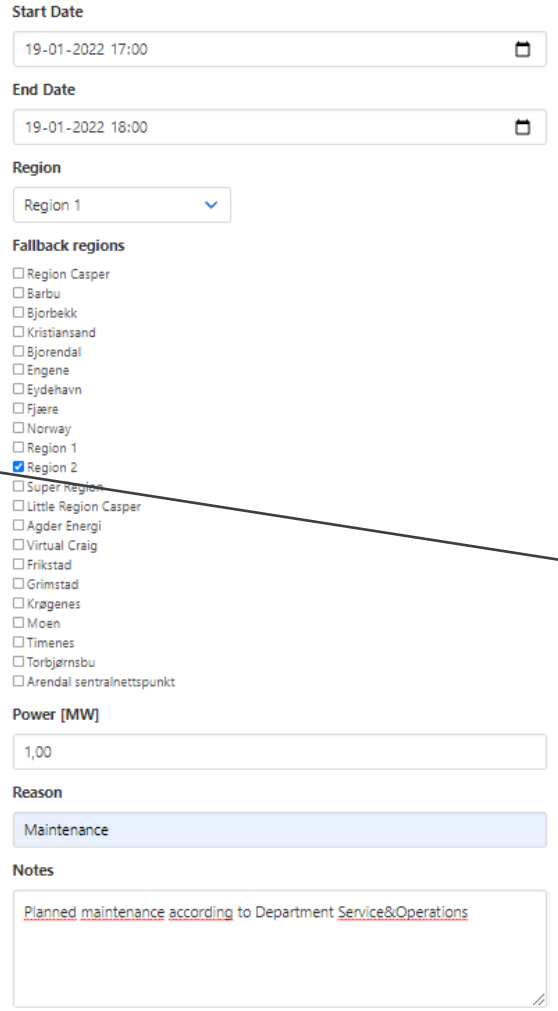
Create events

- Start and end time: Now or later
- Regions incl fall back region
- Power (volume)
- Reason
- Notes



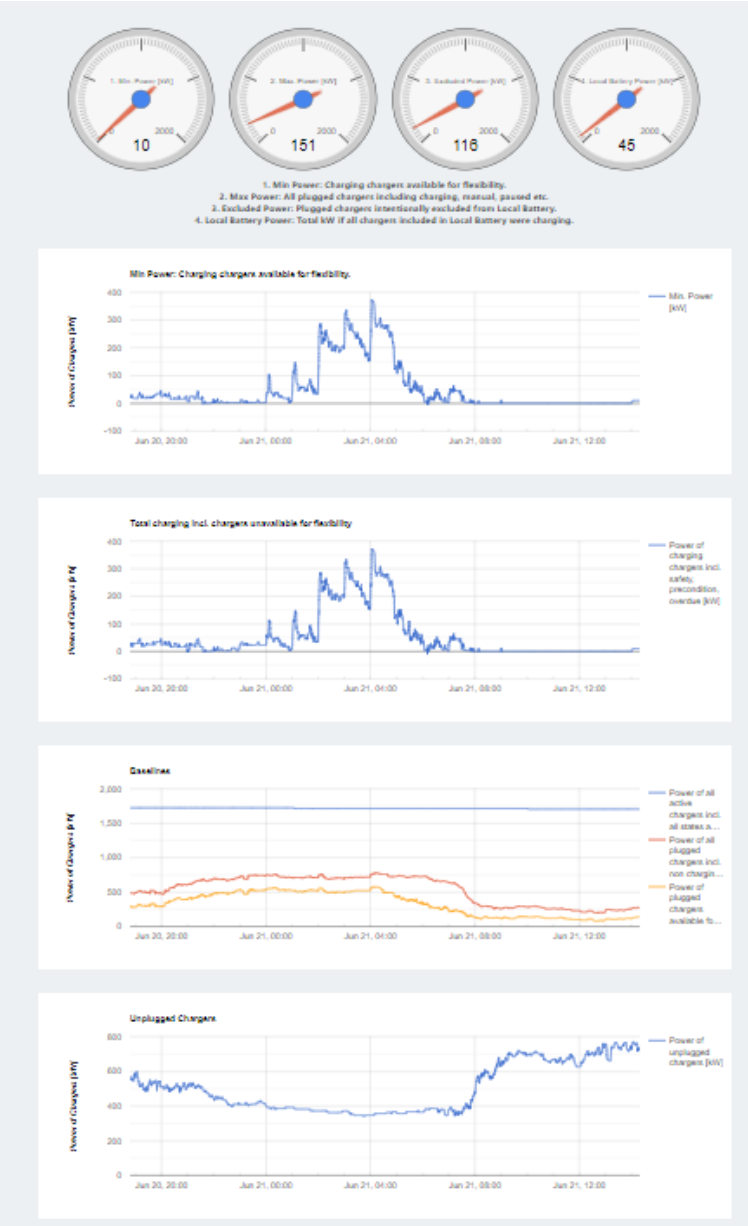
EVENT: PEAK LOAD SHAVING

- Event in the system triggers **all EVs in region to stop charging**
- Charging will start again when event has finished
- User can see charge plan in App: Red coloumn for blocked charging
- Exeptions: Cars on safety and manual charging (EV owners trust car will always be fully charged according to individual preferences)



DASHBOARD AND LOGS

- During event charging activities can be followed on dashboard
  - Charging chargers available for flexbility
  - Power of plugged charges available for flexibility (charging or paused)
  - Total charging incl. unavaible for flexibility (incl. safety, precondition, overdue)
  - Power of all chargers incl. unplugged
- Log/reports can be generated after event and used for validation



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WHAT'S IN IT FOR THE USER/EV OWNER?

- Cable Discount
- Paid out by True's partner or True

LEARNINGS

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The happy ones

- System worked fine
- EV owners willing to participate
  - Or didn’t care…
  - Prioritize EV owners’ needs (car always charged)
- Challenges and needs are the same across countries
  - Market for scalable solutions
- Radius: Forward looking and action oriented
  - Need to develop solutions *now* when grid is not challenged in order to be prepared for future needs
  - Players like True needs funding from buyers

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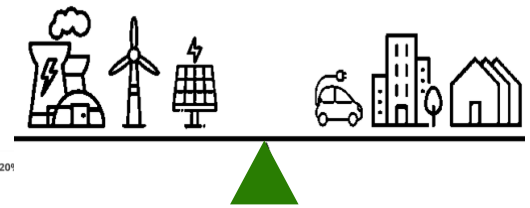
The harder ones

- GDPR
- Baseline (and payment models) to True and EV owners
- Cannibalization: New solutions must be defined and valued in relation to SmartCharge (spot price and time-differentiated tariffs)
- Volume of cars
  - Corona lockdowns
  - Recruit cars locally
  - More flexible user engagement agreements
  - Customer journey (time works for us)

USER JOURNEY FOR EV OWNERS

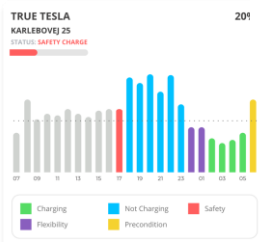


Buys EV

Needs charge box

Charges at home
- Price kWh
- All inclusive
- Reimbursement

Charges on the go
- Subscription
- RFID
- App's
- Credit card



Smart Charging

Support grid flexibility

PERSPECTIVES

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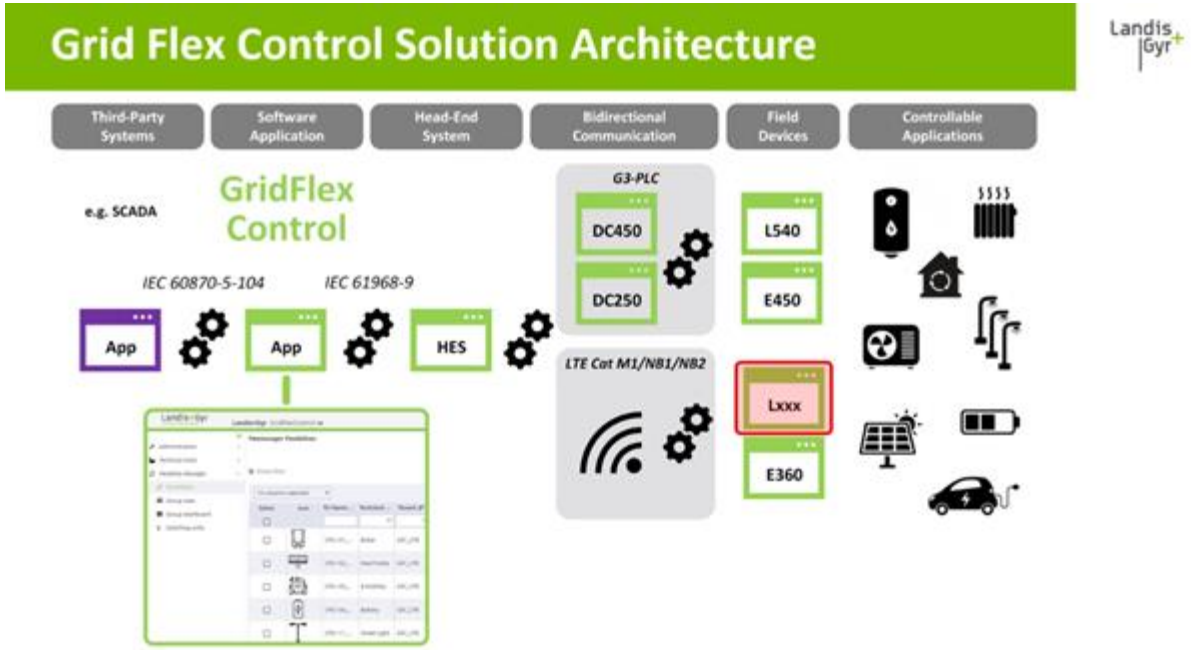
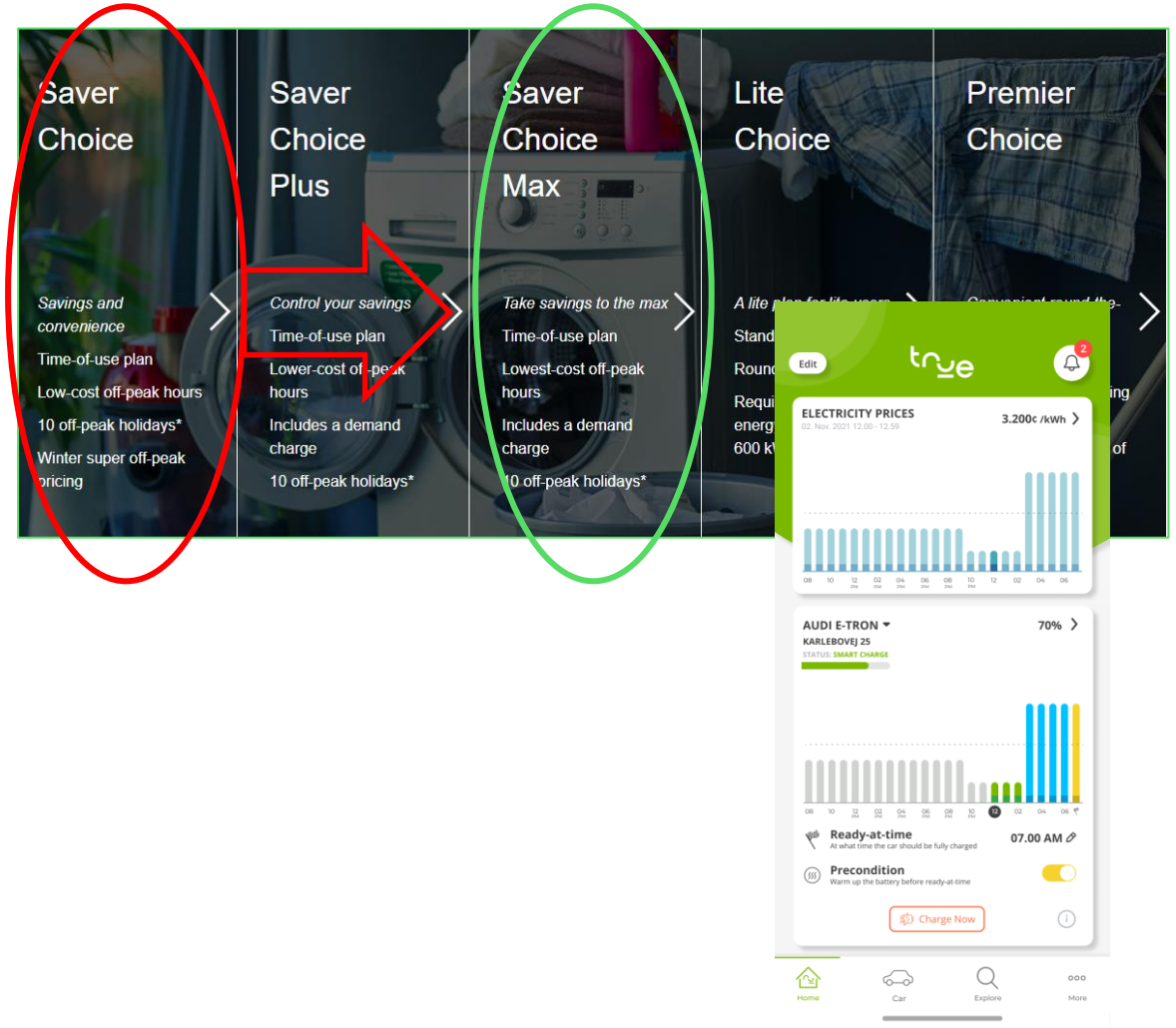
Grid flex in Switzerland: Mandatory relays in meters and DSO control

- Concept:
  Control of heating pumps and boilers via mandatory relay in meters
- System:
  - Edge computing in each meter.
  - Each household has weekly schedules based on profile: Heating pumps and boilers switched on and off through relays to flatten out total household consumption
  - DSO has access to switching off assets in specific local areas in case of emergencies
  - Controls a total of 1,2 mio assets
- Business model:
  DSO Pays Landis+Gyr for service and software
- Running since:
  1945 and onwards…
- Barriers for use in Denmark:
  - Lack of meters with relay that can control outputs
  - Permissions to control output



Arizona flex: Advantage of integrated value chain

- Concept: Price signals controls consumption based on transmission and distribution grid needs.
  - Arizona Electricity is vertical integrated (production, grid and retail in same company).
  - Needs, revenue, customer relations in same company
  - No spotprice, but tarifs that change during the day. 3 seasons and 13 holidays with different tarifs.
- System:
  - True Energy app => control of EV charging
  - Flatten out consumption by tarifs (~SmartCharge)
  - Transmission grid: If unusual/urgent need for load increase: Change tarif.
  - Decentral grid: Risk of overload of transformer or local bottlenecks => Local Battery stops charging in local area
- Business model / payments:
  - SaaS (DSOs pays True)
  - Arizona Electricity provides charge boxes at discounted prices if EV owner accepts flexible charging. And electricity at cheaper prices.
- Running since: 2022est
- Barriers for use in Denmark: Decoupling



Norflex in Norway: Subsidized market

- Concept
  - Local peak load shaving delivered by several suppliers based on different assets.
  - Agder Energi (DSO) buys best bid
- System & business model:
  - Nodes delivers market platform
  - Each seller (aggregator or plant owner) bids available assets at their desired price
  - Buyer (DSO) accepts bid
  - Market platform collects baselines, activates event in supplier's system and provide logs
  - Suppliers' system run the event
  - Market platform bills buyer and pays seller
- Running since: 2021
- Barriers for use in Denmark?
  - Subsidised: Public funded payments to sellers.
    To be consideren when volume is still small
  - No market place (system) and substantial efforts in recruiting sufficients players

Impossible
to do in Denmark???
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"Houston, we've had a problem"
APOLLO 13
IMPOSSIBLE???

COVID-19
WORK FROM
HOME
IMPOSSIBLE???

Electricity grids of Ukraine and Moldova were switched from Russian to European grids in March 2022

”…doing a year’s work in two weeks… ”

…issioner for Energy Kadri Simson

IMPOSSIBLE???

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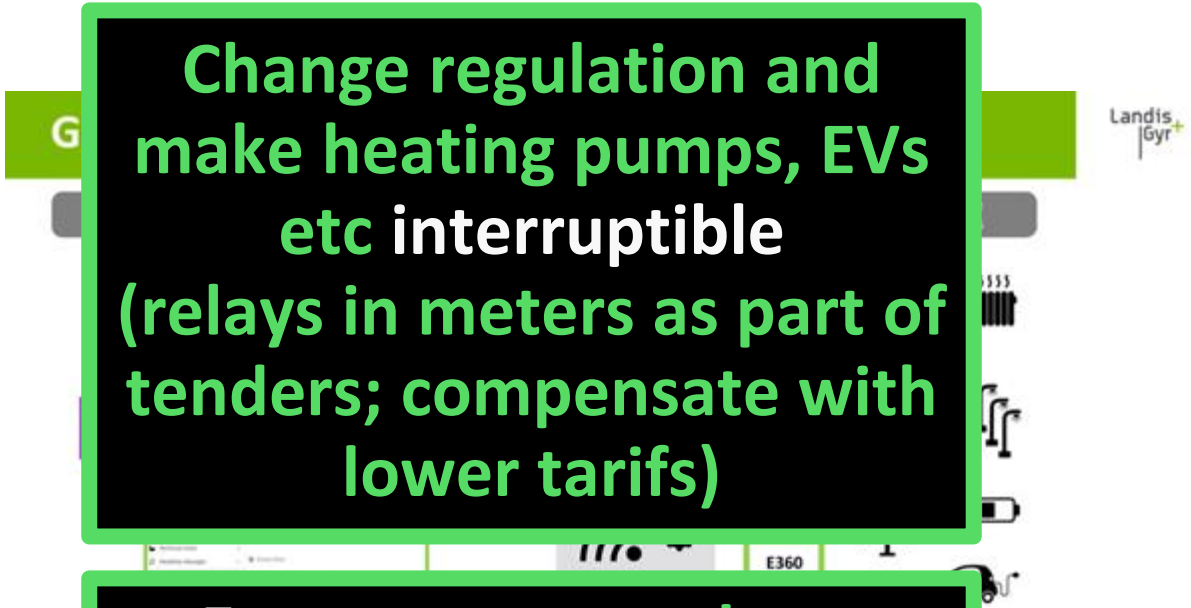

Change regulation and make heating pumps, EVs etc interruptible (relays in meters as part of tenders; compensate with lower tarifs)

Engage users and pay them for each interruption – take advantage of App's, automation, individual behaviour

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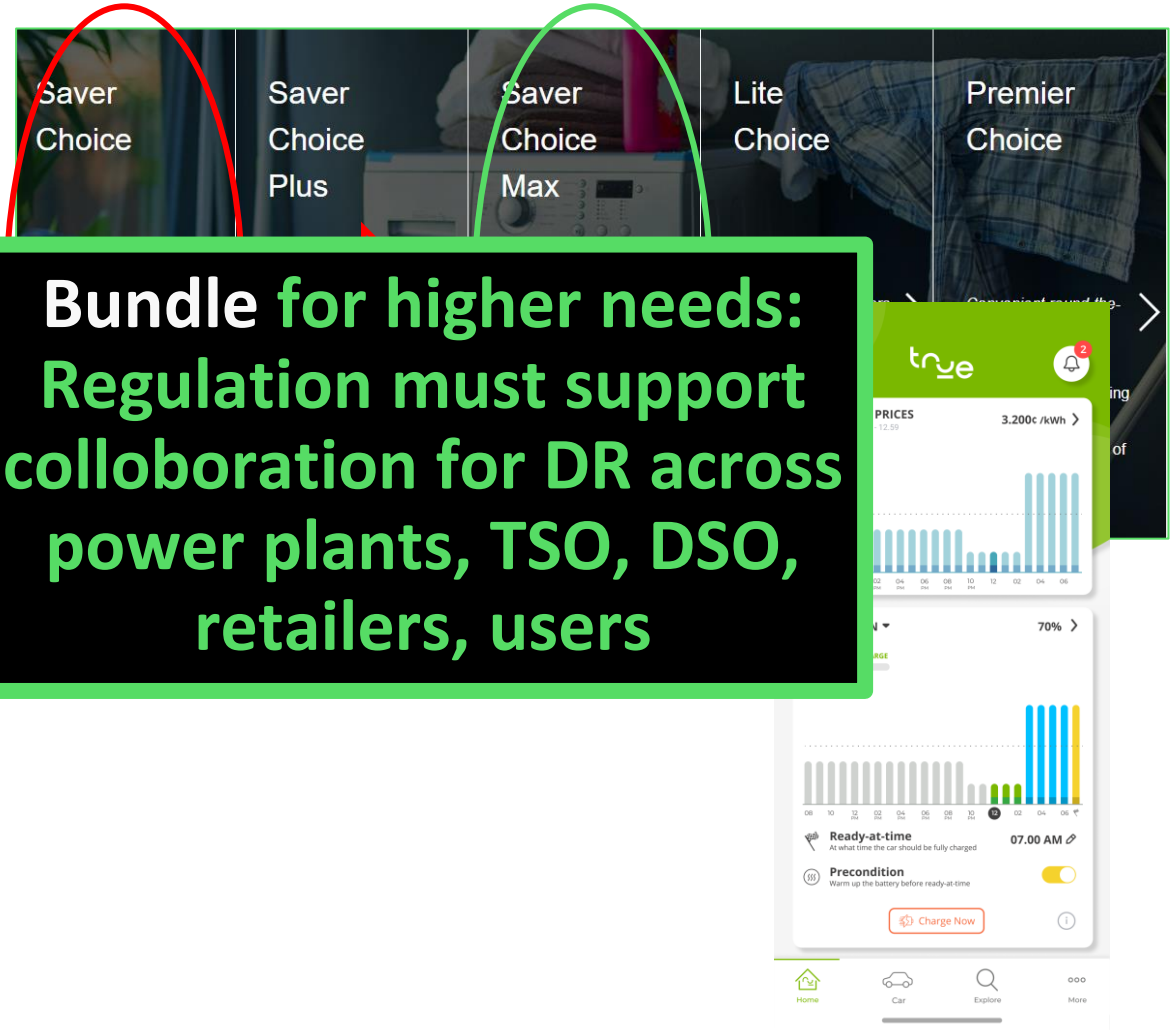

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MOVING FORWARD

- ✓ System works
- ➢ Volume
  - User uptake, recruitment, GDPR
  - Communication, engagement, individual flexibility
- ➢ Payment
  - Compensation to suppliers and users
  - Baselines & Validation of deliveries

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Questions?
Thank you ☺
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a Landis+Gyr company
AUDI E-TRON
20%
Ready-at-time
07.00
Smart Charge
Precondition
Charge History
Charge Rules
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