

Etex case - Bestaansrecht WKK in context van decarbonisatieprojecten en dynamisch energielandschap



CoDE masterclass 18/06/2026
De waarde van flexibiliteit in volatiele energiemarkten

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Proven real-time steering for the industry

the optimizer / digital twin takes care of the downstream complexity

1. Process first

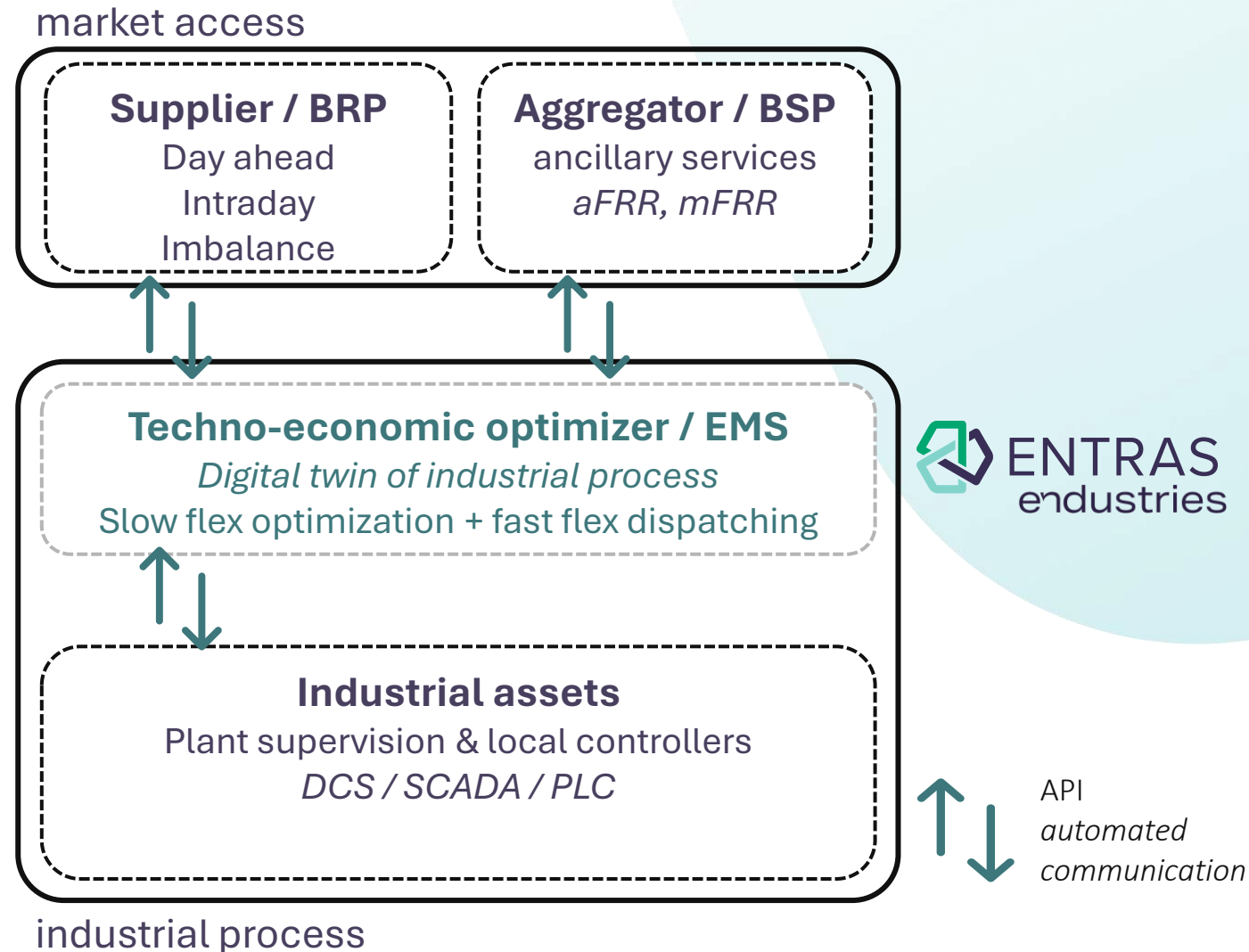
- › digital twin in the cloud
- › behind-the-meter
- › multi-asset, multi-energy
- › all technical & operational constraints are respected by the algorithm
- › bridge operations with energy

2. Integrate & automate

- › integrate with local control system
- › integrates with any EMS
- › automated nomination & steering
- › dispatch reliable and predicible flex MWs to the market

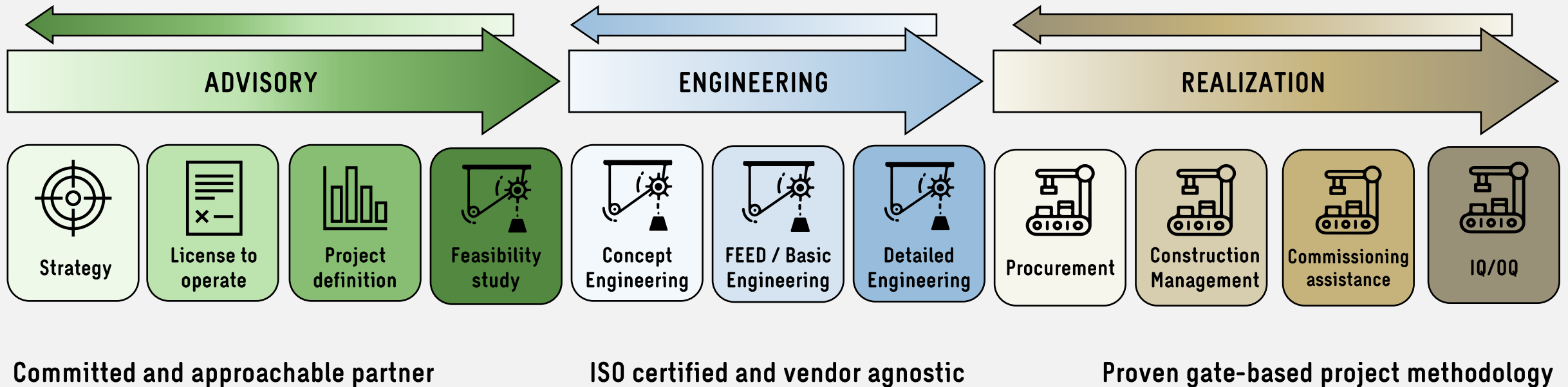
3. Market access

- › Free choice of supplier / aggregator



Your partner to transform strategy into reality

Sweco as one-stop-shop EPCm solutions provider



Focus Climate, Energy & Environment

Focus on **advisory services** and **engineering** up to and including **permit** and **financial investment decision (FID)**

Energy-intensive industries need a future proofed energy strategy

In today's industrial landscape, rising energy prices, sustainability targets, regulatory requirements, grid constraints and margin pressure demand strategic vision that looks beyond short-term challenges and focuses on long-term resilience.

30% Avg. potential cost reduction via strategic energy management

Active collaborations (selection):



Our services, tailored to your needs

Energy cost reduction: techno-economic advisory

- **Process innovation and asset optimization:** ovens, dryers, distillation/membranes, flue gasses, evaporators, reactors, green molecules
- **Heating/cooling optimization:** pinch analysis, heat source/sink mapping, waste heat recovery, thermal buffering, thermal oil circuits, smart heating grids (private and district), steam/hot water, CHP, chillers, dry/adiabatic coolers, cooling towers, batch process
- **Electrification:** (add-on LT/HT) heat pumps, MVR, e-boilers (resistance/electrode), process electrification
- **Utilities optimization:** compressed air/vacuum, cooling water, pumps/fans/motor, relighting, RES/BESS-integration, HVAC optimization

Electrification and flexibility

- **Behind the meter:** load shifting, peak shaving and day ahead arbitrage process and site level (BESS/thermal storage/...)
- **Front of the meter:** intraday, imbalance, ancillary services, CRM
- **Grid connection studies and capacity advice**
- **Energy management system (EMS) advisory**

Strategic roadmapping

- **Strategic decarbonization roadmap for full-scope 1/2/3** with integrated scenario analysis, electrification and CAPEX planning
- Sweco in-house **Futureproofed SaaS for carbon accounting**
- Ensuring **compliance** with regulatory framework and (future) legislation (e.g. ESG/CSRD, EED/VEKA/EBO),

Energy procurement and contracting

- **Energy profile / contract analysis and smart purchasing strategy** based on site consumption and on-site generation
- **Negotiation of energy supply contracts** to reduce costs and risks including monthly energy health check
- **Hedging/clicking advice and PPAs** for long-term price stability

EPCm engineering and permitting

- Full-scope **pre-FEED, FEED, basic, and detailed engineering**
- **Procurement and construction management**
- Full in-house **environmental impact assessment and permitting** (urban planning and environmental) applications
- **Audits & subsidies:** ETS1/2, ISO50001, ISO40001, eligibilities

Contact us



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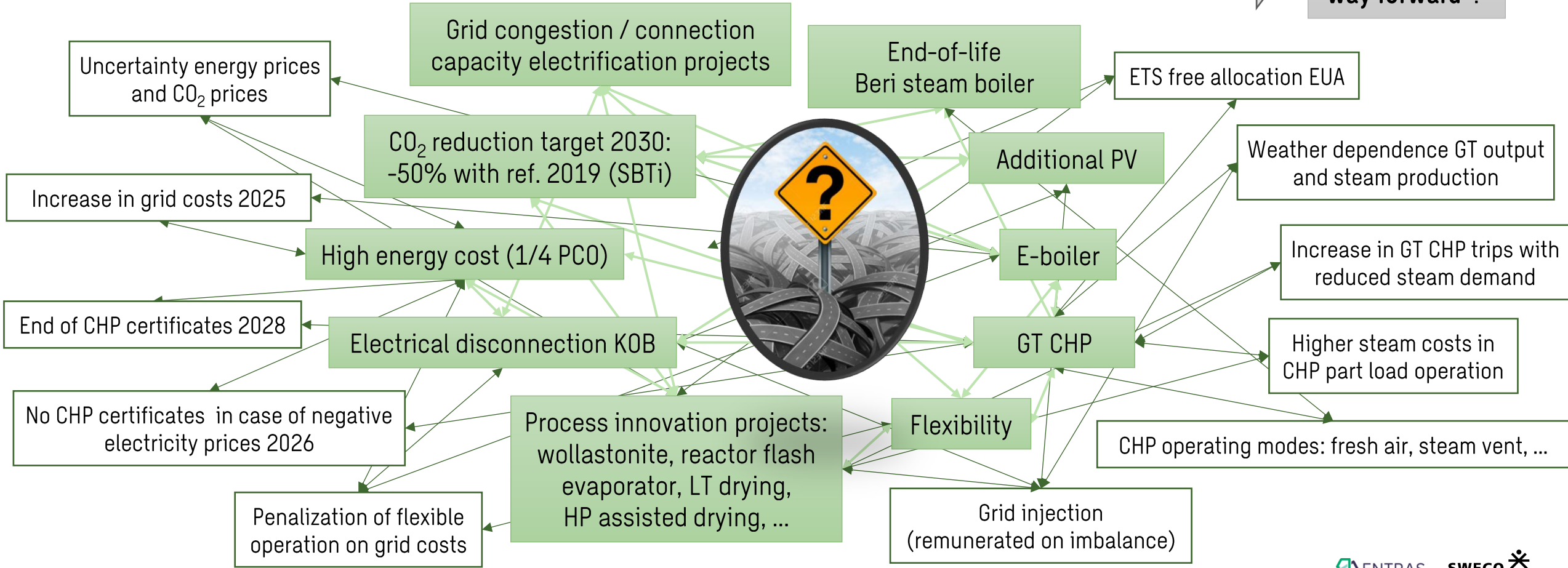


Mapping complexity energy & CO₂

Holistic insight is missing → investment choices?

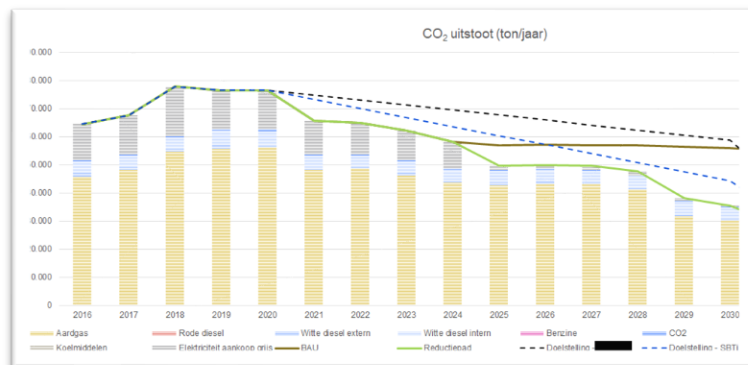
Challenge
Complexity and mutual implications of choices

➔ What's the "way forward"?



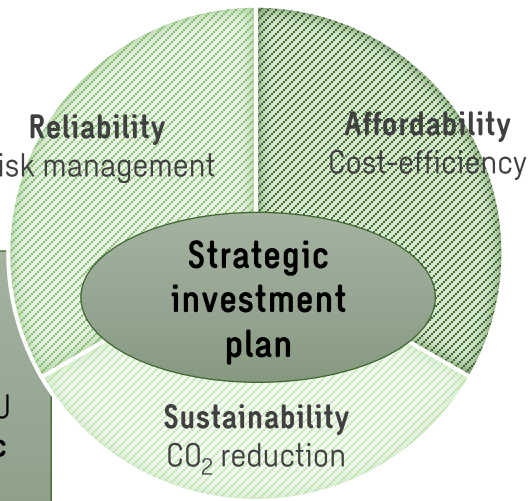
Plan of approach

Development of strategic decarbonisation roadmap for Etex Promat (Tisselt, BE)



WP4: Strategic decarbonisation map

Horizon 2030/2050 CO₂ and OPEX roadmapping evaluating baseline BAU and dedicated transition path scenarios, resulting in a **phased strategic investment plan** & decarbonisation roadmap.



WP1: Energetic blueprint current situation

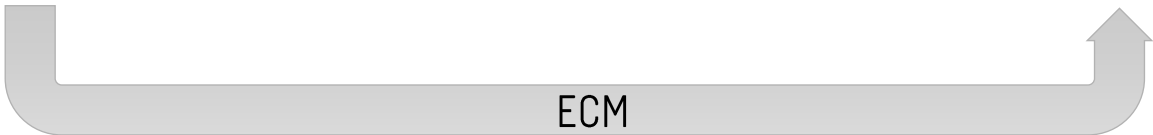
Development of tailor made **energy conversion model (ECM)** capturing the physical and contractual complexity of Etex energy system.

WP2: Decarbonisation measures at process level

Identification and techno-economic assessment of **cost effective decarbonisation measures** at process level + impact on energy demand profiles.

WP3: Energy conversion assets at site level

Value assessment of different **energy conversion assets** (GT-CHP, PV, e-boiler, gas boiler, ...) taking into account mutual interaction/implications of different projects/assets and flexibility opportunity.



ECM "Energy Conversion Model"

Objective and added value – holistic approach

- **Purpose / objective:** taking into account **the physical and contractual complexity of the GT CHP** and **mutual interaction of different projects/assets**, calculate back from set of (reduced) **energy demand profiles** to the **energy flows at site level and OPEX**

- **Added value ECM**

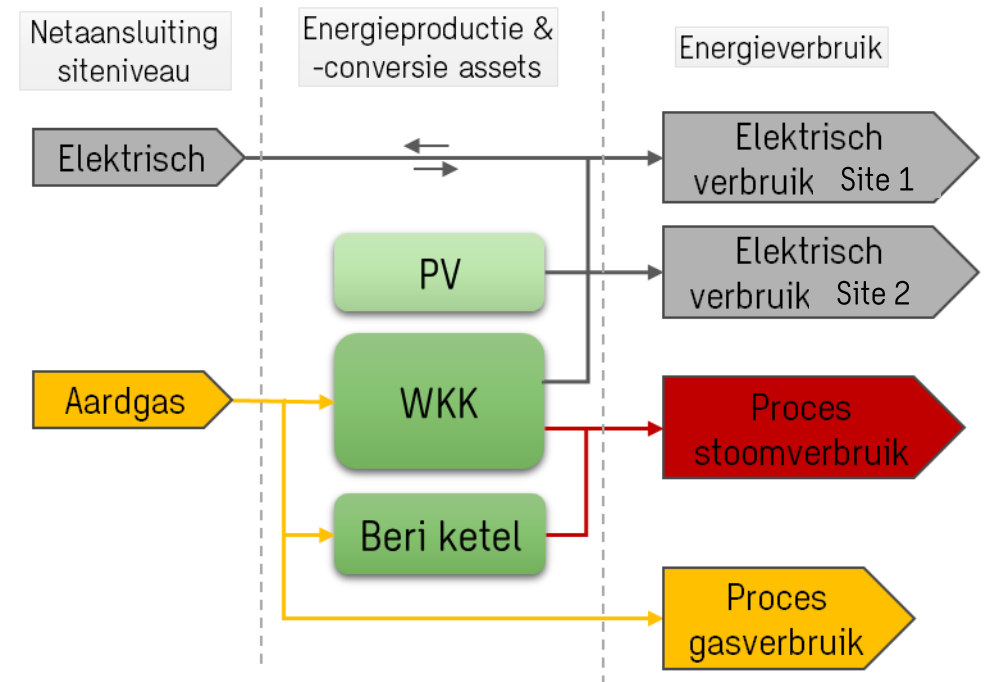
Enabler for **integrated scenario analysis** through complete modelling of energy system and energy contract structure

Basis for **e-boiler and CHP flexibility evaluation:** modified demand profiles for steam and electricity as well as CHP operating regimes

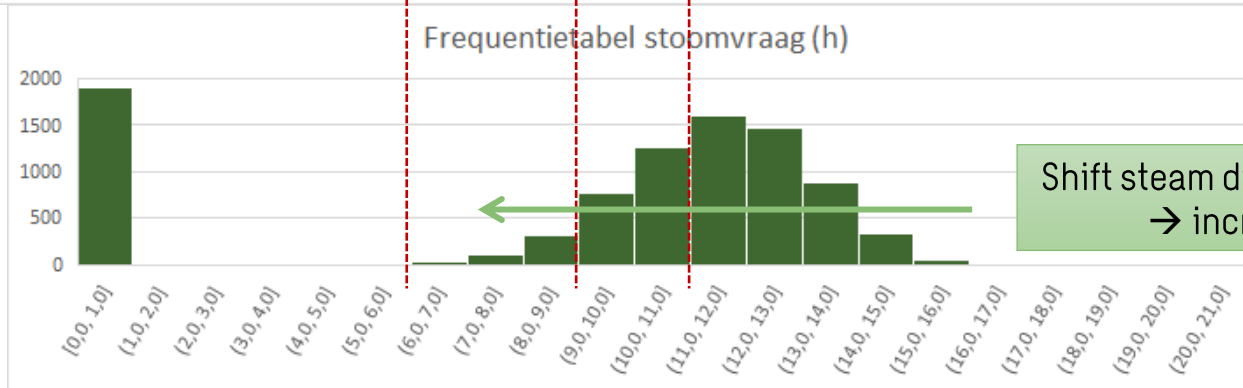
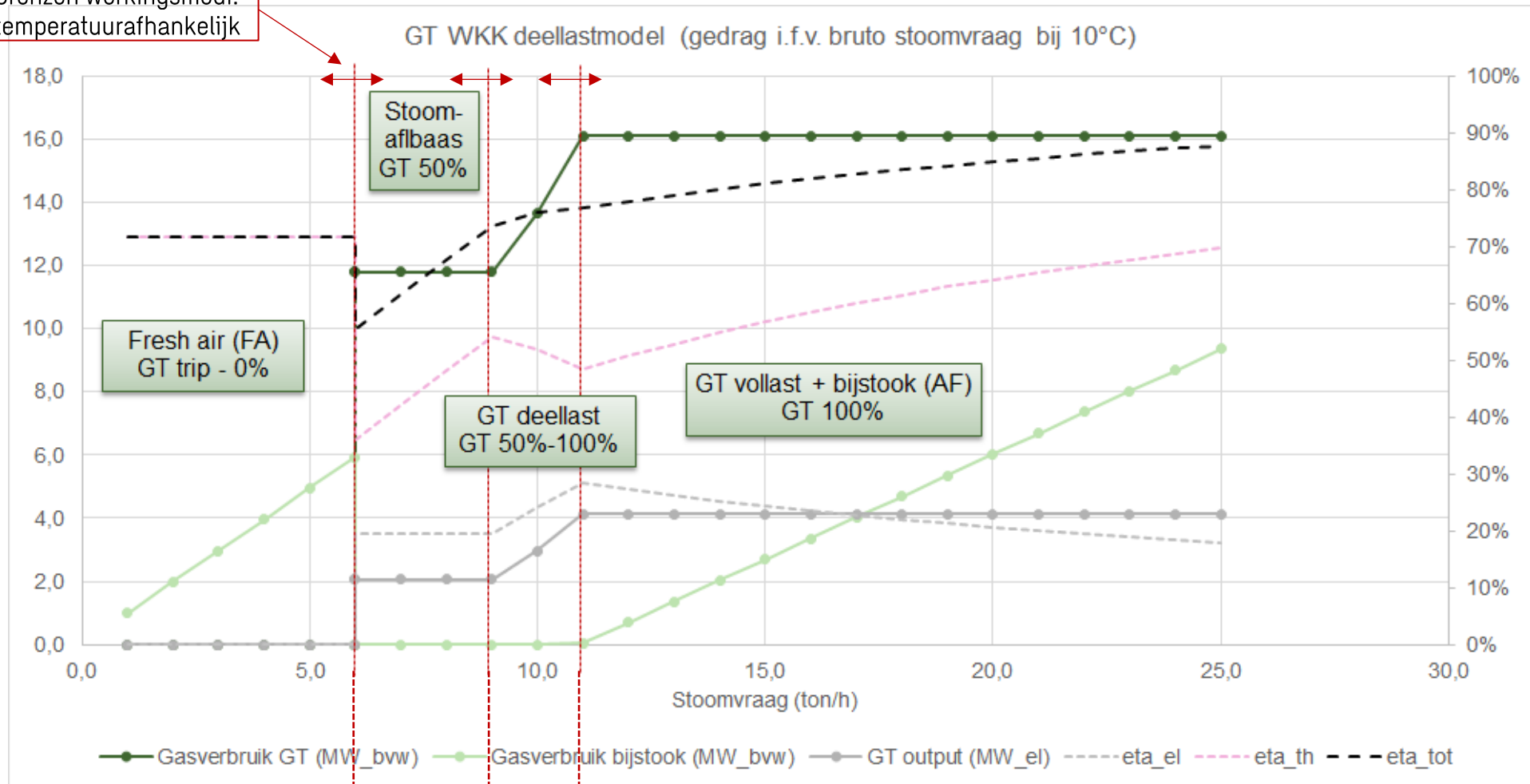
Capturing the complexity of site energy system with multiple assets

Impact assessment of decarbonisation projects and energy conversion assets

More realistic picture of **financial savings** of decarbonisation projects taking into account



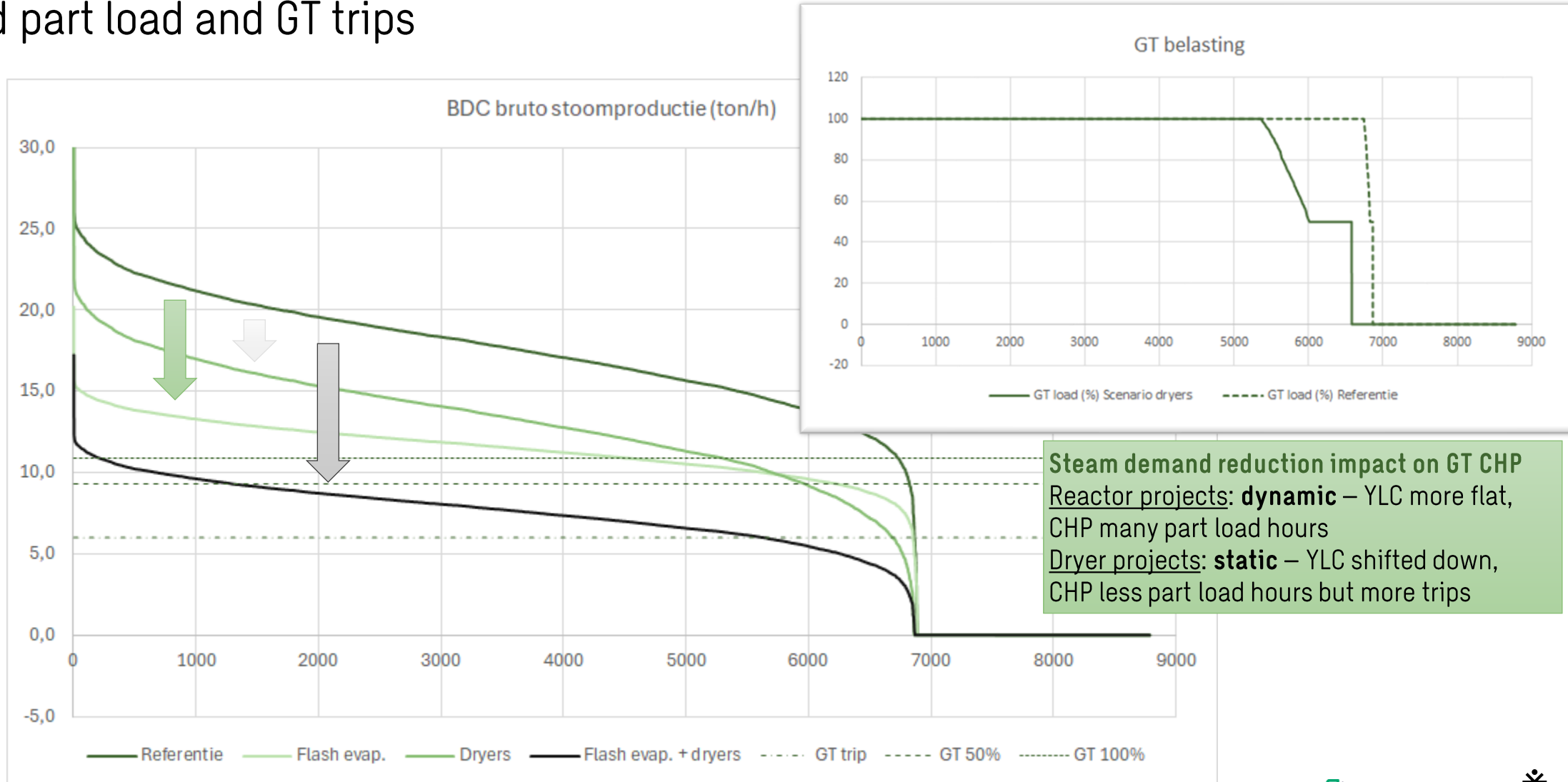
Grenzen werkingsmodi:
temperatuurafhankelijk



Shift steam distribution to lower demand
→ increased CHP part load

CHP analysis KPI's at reduced steam demand

Increased part load and GT trips

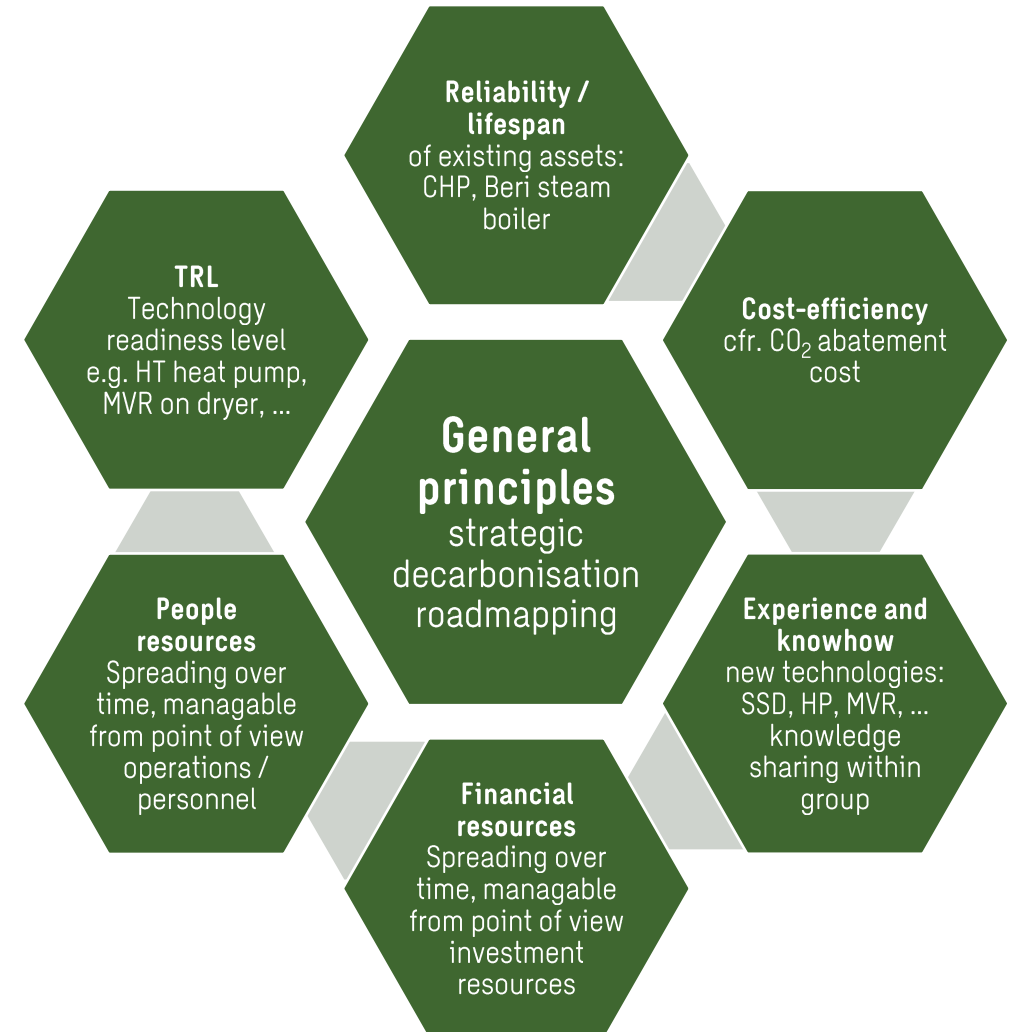


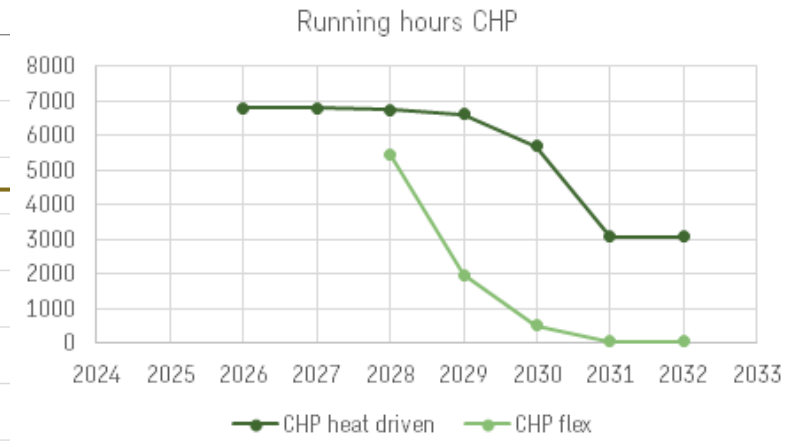
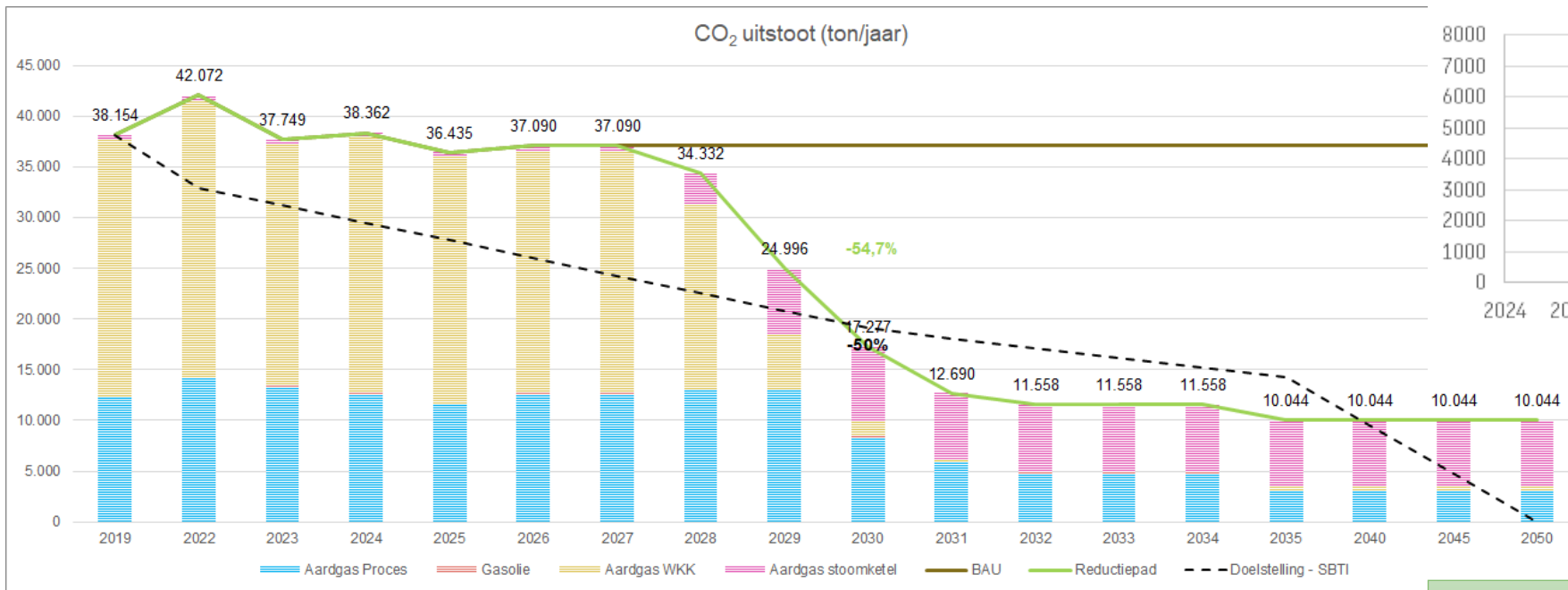
Strategic insights and starting principles

Etex site specific vs. general

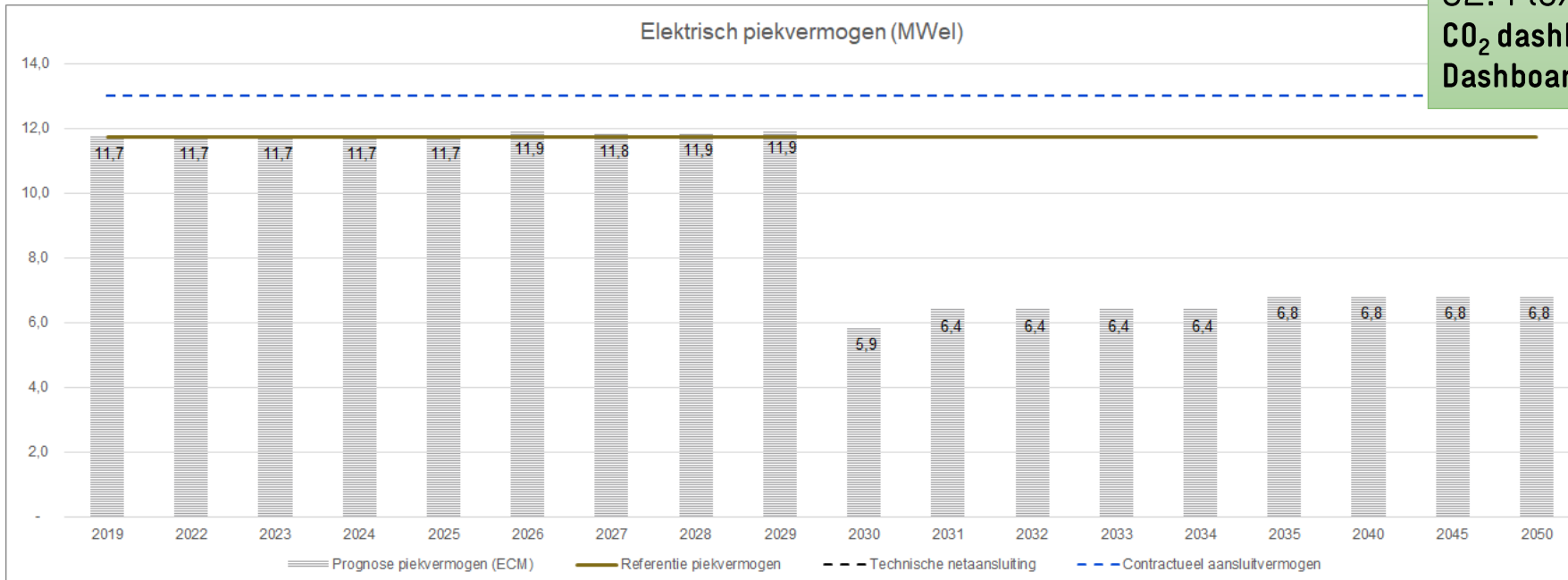
Strategic insights **Etex site specific**

- › With the CHP operational, **cumulative financial savings from major decarbonisation projects** are significantly (20-25%) less than individual savings → driver for exit-CHP or flex-CHP
- › Projects on dryers / **static steam reduction** leads to part load operation and trips of the CHP (and unattractive financials) more rapidly than projects on reactors / dynamic steam reduction
- › **Flex CHP enables for implementation of decarb. projects** without current (steam related) physical and contractual restrictions





S2: Flex CHP + all decarb. measures
 CO₂ dashboard
 Dashboard electrical peak demand



Flexibility supports electrification in industry

Context

› Energy Transition

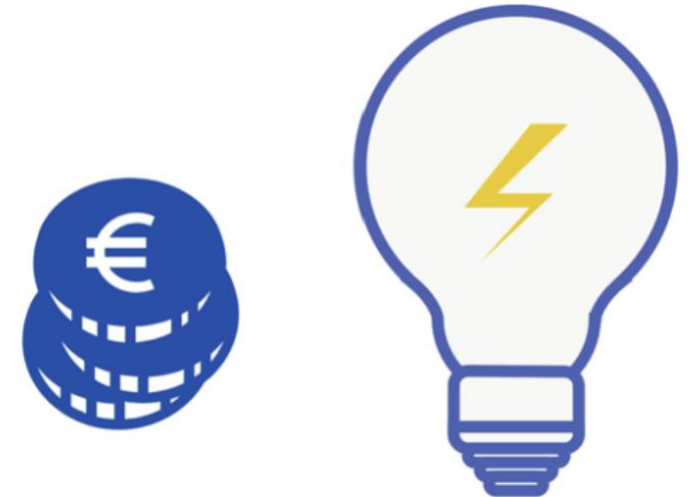
- › Complex: technologies, process changes, electricity market volatility
- › Many options – decarbonization roadmap required

› ETEX: Operational CHP

- › Certificates (WKC) will stop soon

› Business case

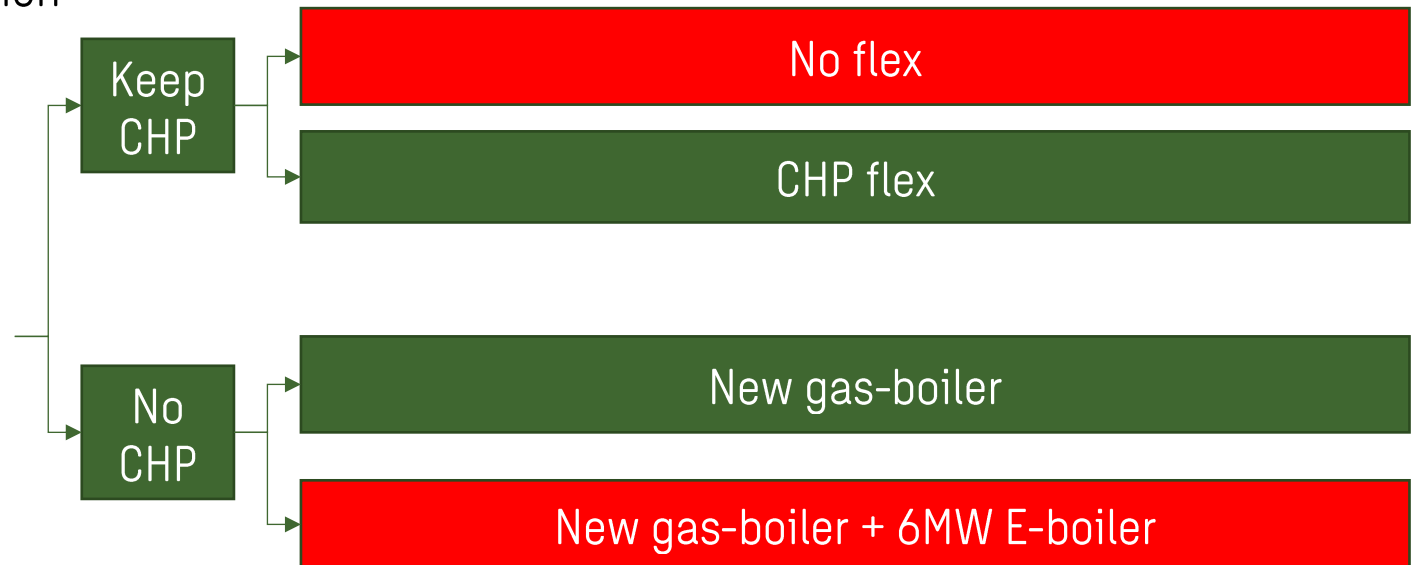
- › Decarbonization implies CAPEX investment
- › Flexibility to keep OPEX lower?



Flexibility supports electrification in industry

ETEX - scenarios

- › Decarbonization roadmap
 - › Projects to reduce CO2
 - › Each project has different CAPEX, savings, timeline, ...
 - › Each project has an impact on heat / electricity demand
- › Roadmap includes process & energy production
- › Options for steam demand at ETEX:



Flexibility supports electrification in industry

Many options



Renewables



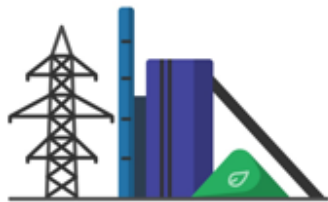
Batteries



Industrial
process



Power
Plant



Biomass

Wholesale market

Day-ahead market

Intraday market

Imbalance market

Buy Low – Sell High.

Ancillary services

FCR, aFRR, mFRR

Congestion management

Support the grid.

Support & capacity

CRM

Project based subsidies

Security of supply.

Grid cost & congestion

Prevent curtailment

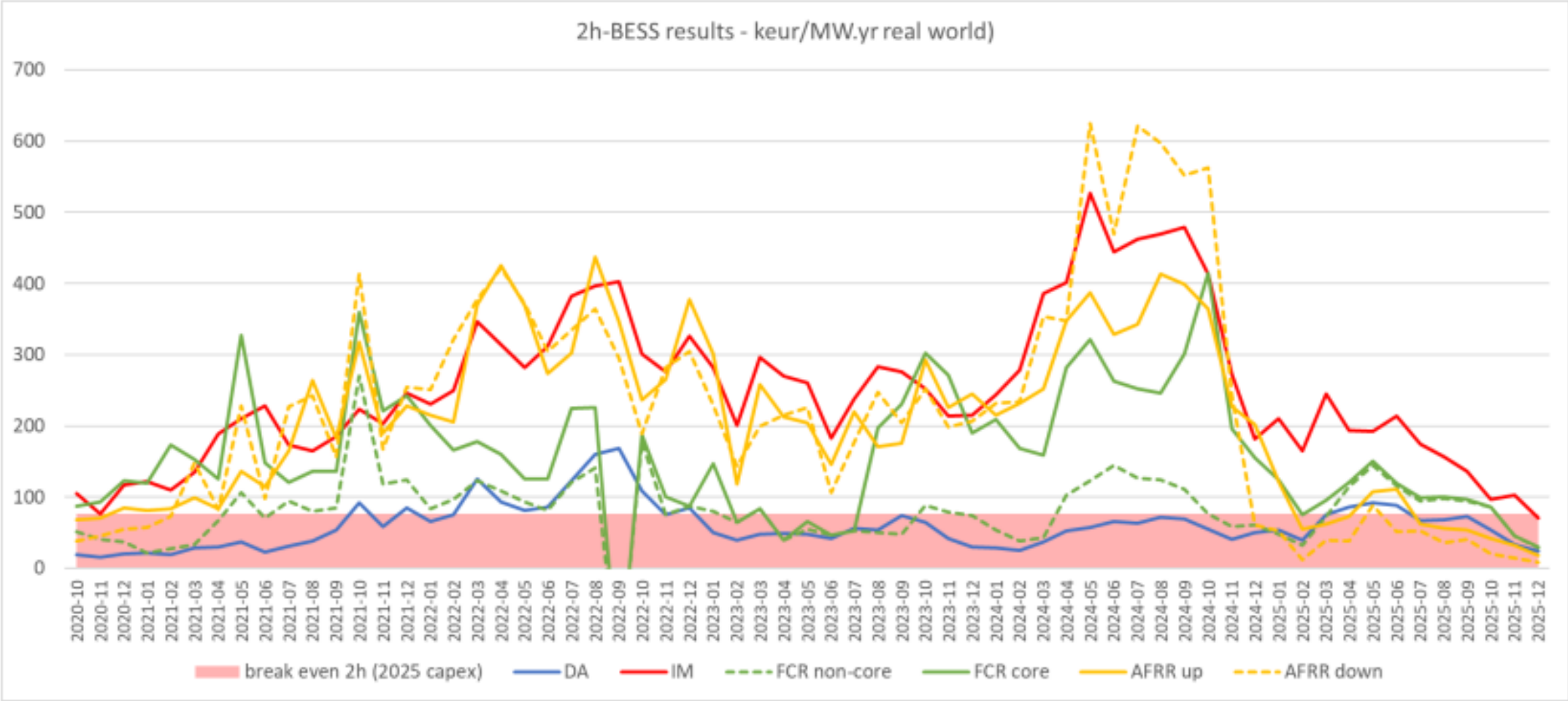
Behind the meter

Local synergies.

(c) Entras

Flexibility supports electrification in industry

What is the value of flexibility today & tomorrow?



Flexibility supports electrification in industry

Simulations - example

- › **Operational costs** in 3 scenarios, simulations related to decarbonization projects
 - › CHP heat driven
 - › CHP flex
 - › Gas boiler
- › Combinations are possible
- › Input for business case assessment
- › Analyse financial implications of decarbonization roadmap

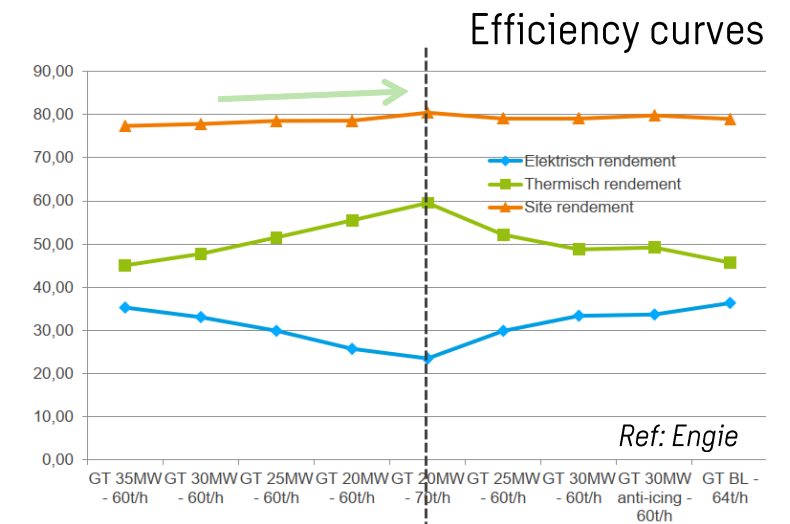
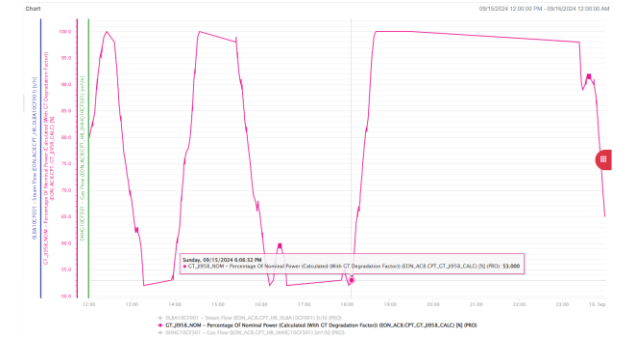


Flexible operation GT CHP

Technical boundary conditions & points of attention

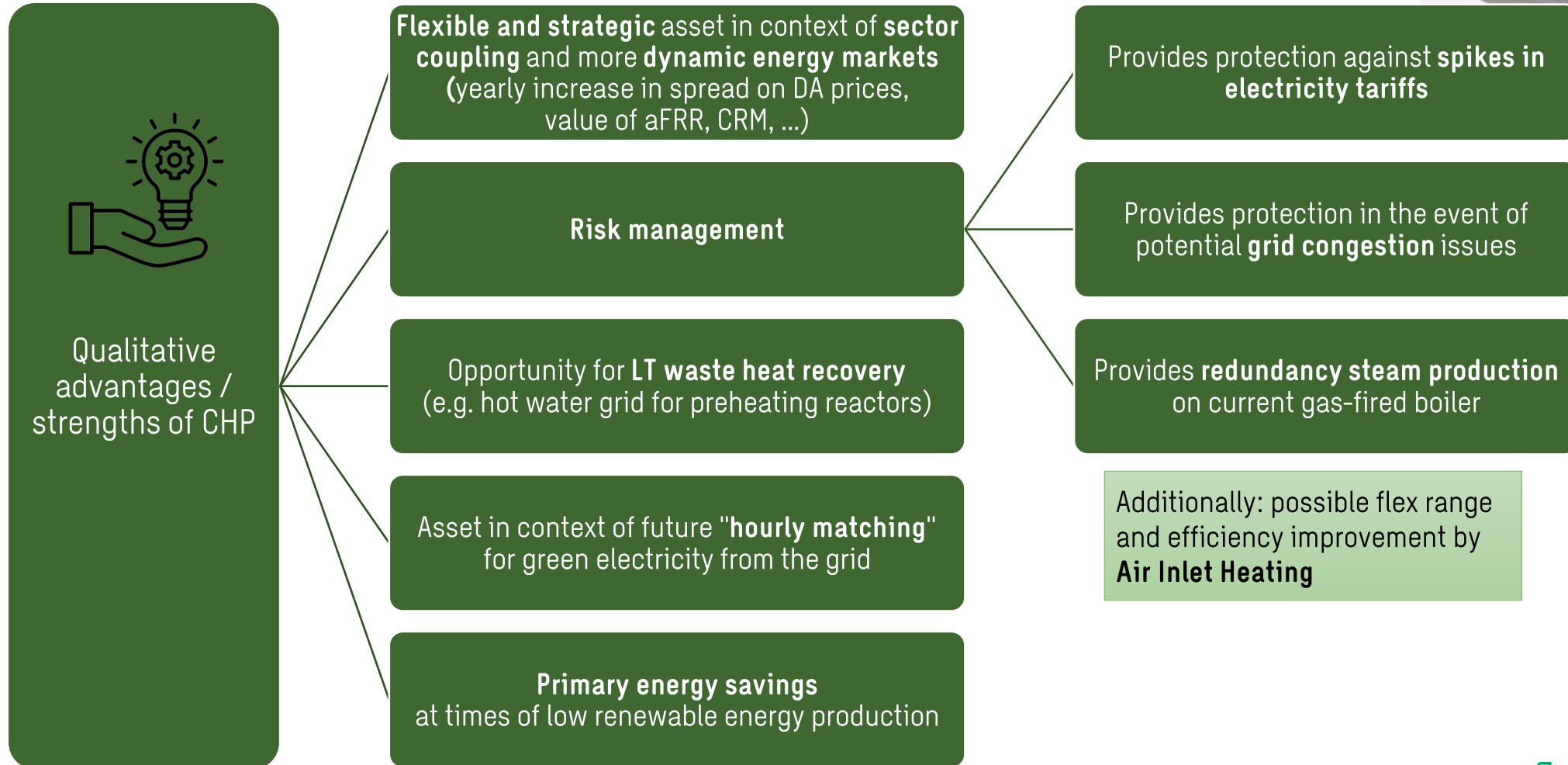
- **Type gas turbine**
- **Ramp rate** depends on GT, boiler construction and MV grid
- **Construction boilers** (HRSG and back-up boiler) → case-specific evaluation
- **Cycling** - start/stop running regime, impact on lifetime and on maintenance schedule (and cost)
- **Reduced auxiliary firing** when GT is at lower load

- Impact part load on **CHP efficiency**
- Impact start/stop regime on **maintenance costs**
- Impact on **emissions** (NO_x) at part load
- Less certificates (**WKC**)
- Less **local advantages** (avoidance distribution tariffs) + possibly higher connection costs
- Adapted **control systems** for flexible operation of GT, auxiliary firing etc



Strategic value of CHP

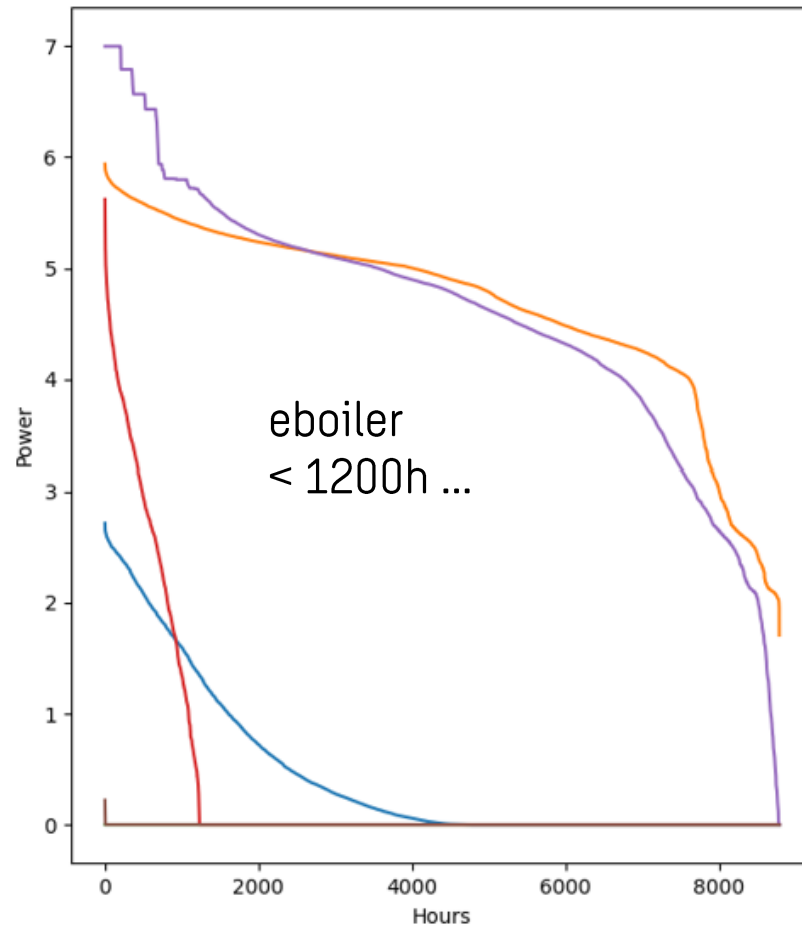
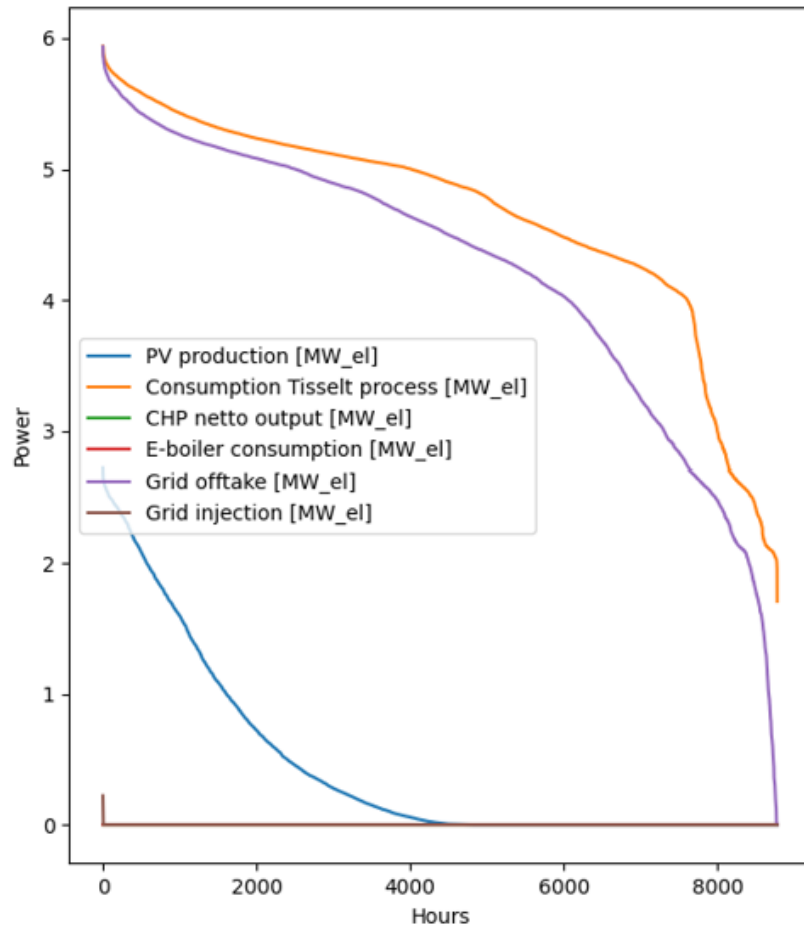
Qualitative advantages in current and future energy landscape



Flexibility supports electrification in industry

E-boiler flex

› Simulations on day ahead market show limited potential:



Flexibility supports electrification in industry

E-boiler flex

› **E-boiler reduces emissions**

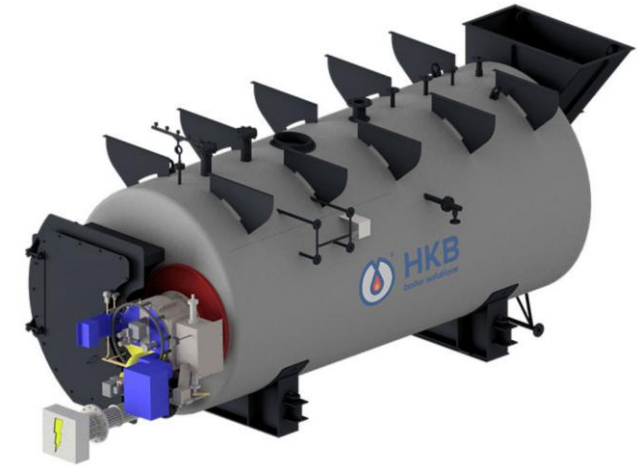
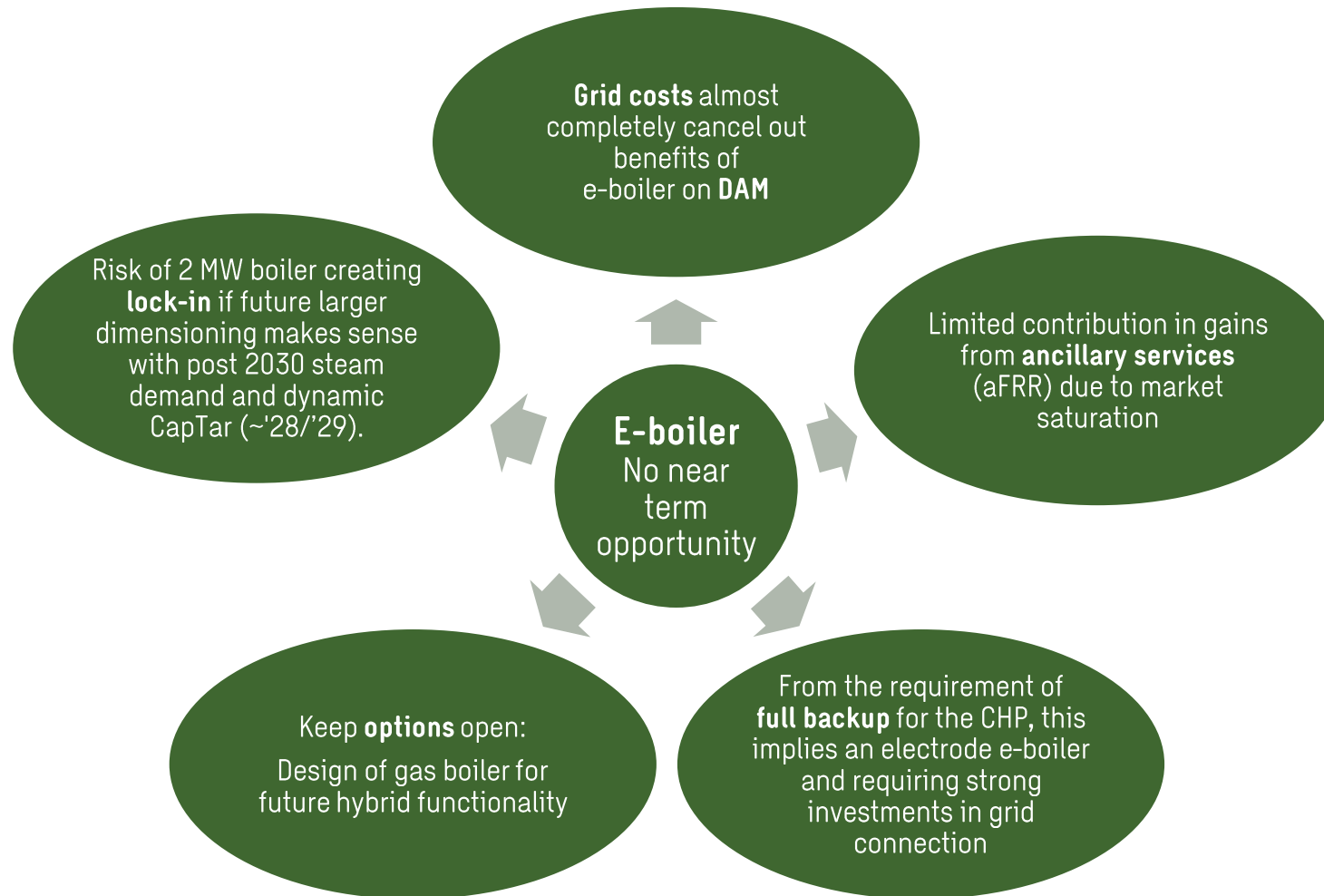
- › Sizing – on peak steam demand or on payback?
- › Revenues from slow & fast flex
- › High CAPEX due to grid connection
- › High OPEX due to captar
- › Smaller e-boiler can shave peaks, but less CO2 savings

› **Feasible investment?** Keep options open:

- › Gas boiler with option for hybrid fuel
- › Wait for ...
 - › Different tariff structure (e.g. time-of-use to reduce captar)
 - › Different market conditions / energy price level & volatility

End of life steam boiler: new gas boiler or e-boiler?

No near term opportunity for e-boiler



Want to know more?

Scan and get more **insights**

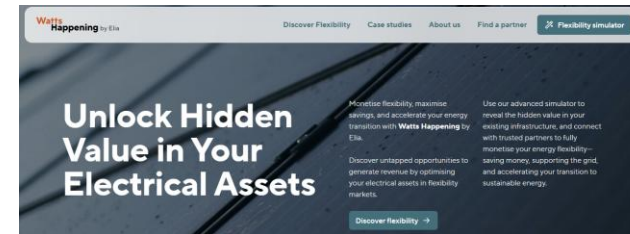


This is what will happen

- › We ask to answer some questions, for our survey 'industrial flexibility'
- › You get in return
 - › Access to use cases with detailed information
 - › The (anonymous) results of the survey
 - › Slide with flex revenues for different use cases

Energy transition is hot...

Some links for the energy enthusiasts...



#1 software to optimize all your energy assets

Energy flexibility starts here.



Entras builds **software optimising industrial energy** systems. The demand side response in action.

Start saving money →

Discover our software



Q&A



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