Bettergy

Choose what do you want to do with the clean energy of the Sun

### Proposal

Start saving right now, choose what suits you best

### Operation

Change your settings and update your hardware

### Monitoring

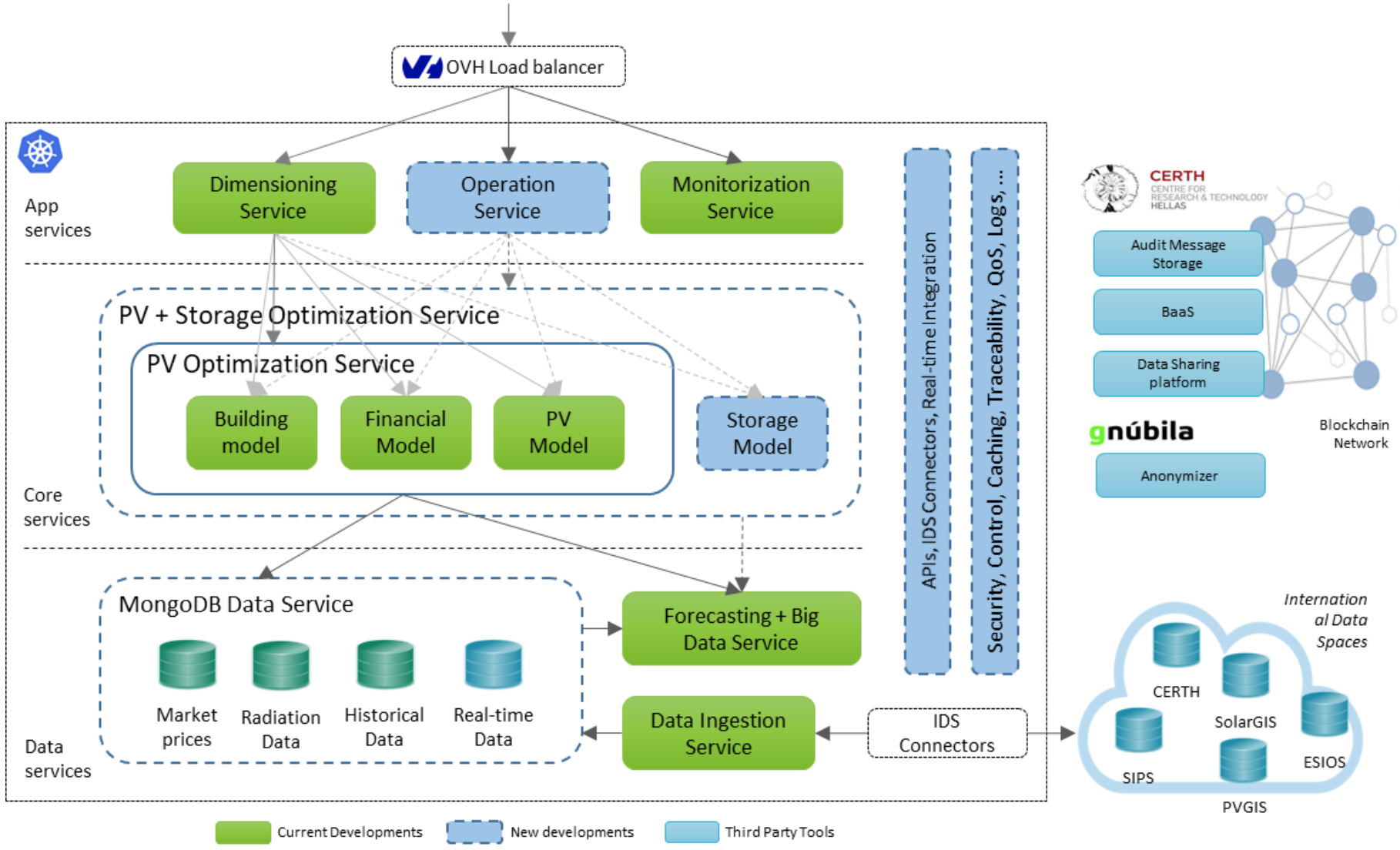
Daily cool charts, tables and big data analysis

# DSS :Digital Solar + Storage

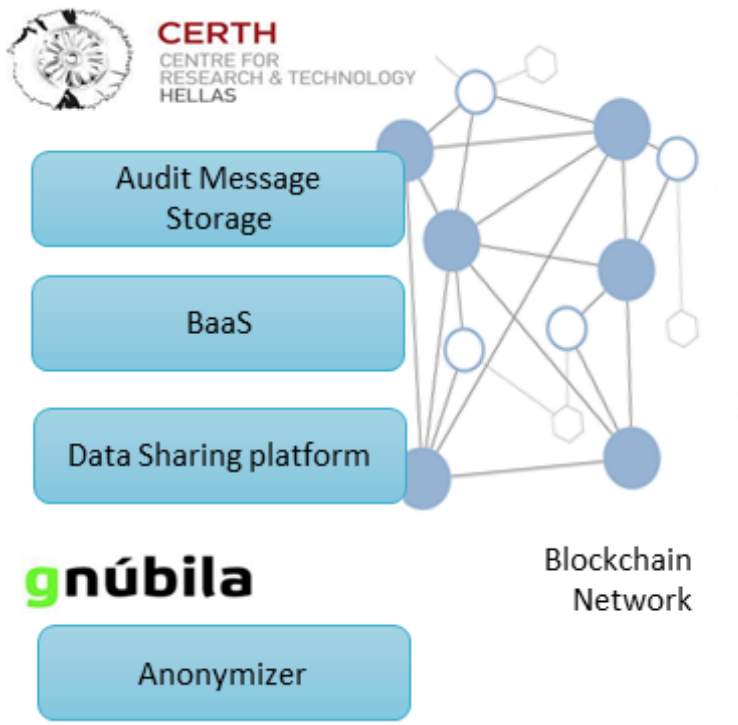
## “energy sources optimization”

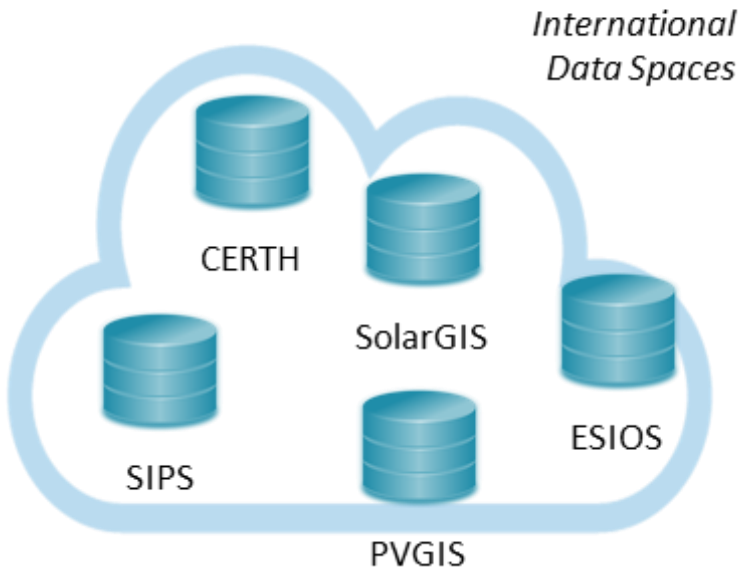
https://bettergy.gitlab.io/storage-as-a-service/saas/

# Solution Overview

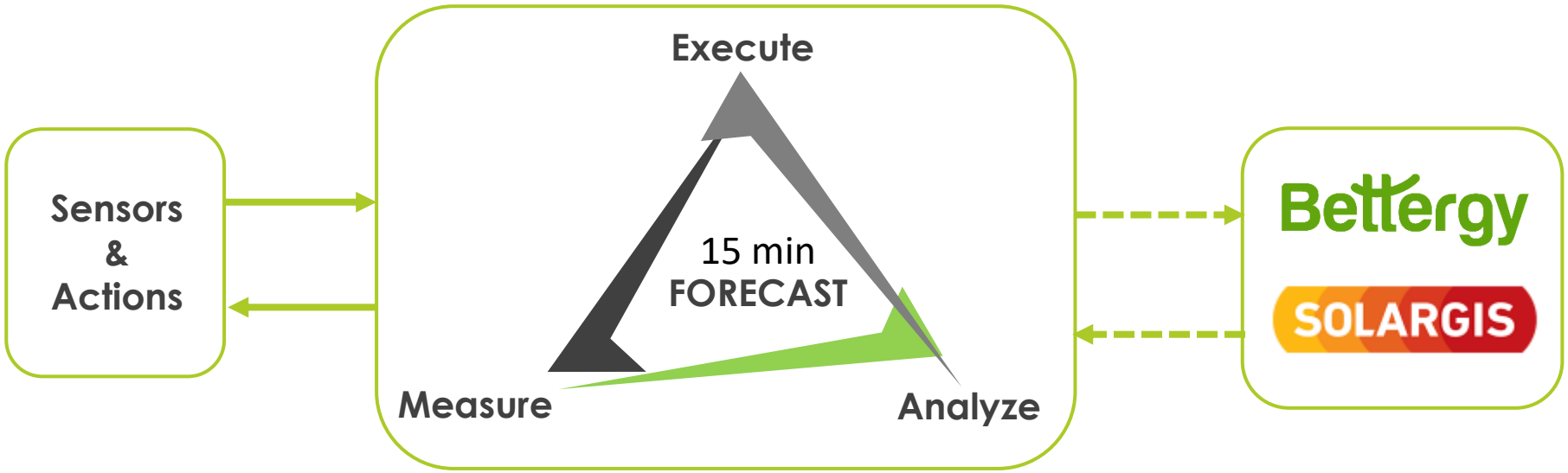


# REACH Toolbox and Data Initiatives



# From Dimensioning to **Operation in Real-Time**




## Big Data inputs

- CERTH Dataset (Data Provider)
- Consumption Data
- Radiation data
- Geographic location
- …

## Multi-Objectives

- RES Optimization
- Storage optimization
- Profitability
- Energy savings

## Algorithms & Tools

- Stochastic programming
- Predictive Models
- Markov Chains
- Python Libraries. Pandas, Scipy, Tensorflow, keras

# Data governance & Risk management

| Risk | Impact | Risk/Op | Actions |
|---|---|---|---|
| Algorithm accuracy | High | Medium | OKRs definition \| Continuous involvement of energy efficiency with RES expertise and data scientists in the analysis, design and testing phases \| Set of truth (CERTH) \| SOLARGIS integration for radiation forecasting \| R&D collaboration with optimization expert groups from the University of Málaga OWASYS |
| Software performance and scalability | Low | Medium | OKRs definition \| Technology roadmap update \| REACH & external expert support \| Microservices \| Kubernetes |
| Data security & transparency | High | Low | Monitoring of the cloud infrastructure, data transfer, and intrusion detection \| Blockchain datatools \| GNUBILLA anonymization |
| Project execution | Medium | Low | Leading member with 24/5 work full time dedication \| Lean Startup Methodology \| Detailed planning with JIRA TOOL |
| Market oriented product | Medium | Low | Product owner leadership \| Customer discovery activities \| Canvas \| Competitor's benchmark \| State of the art \| OKRs definition & metrics \| Potential customer pilot deployment in real environment \| Updated Support for storage regulations, rebates and utility rates \| Storage Manufacturer equipment restrictions \| Integration with our Software Platform |

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*Wellcome to **the future of Energy + Storage***

*Wellcome to **DSS***

# Thank you!

https://bettergy.gitlab.io/storage-as-a-service/saas/

# Annex

Visit de Mockup at

https://bettergy.gitlab.io/storage-as-a-service/saas/

1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Proposal Info

Create a proposal, here is where you can define all of the project inputs, and the control settings to achieve your economic and environmental goals. Start by introducing your proposal title and description, then upload your energy use consumption profile.

Title

Energy Sources Optimization (REACH)

Description

CERTH Data Proposal

## Energy Use Data Profile

Electric Bills

SpreadSheet

Green Button

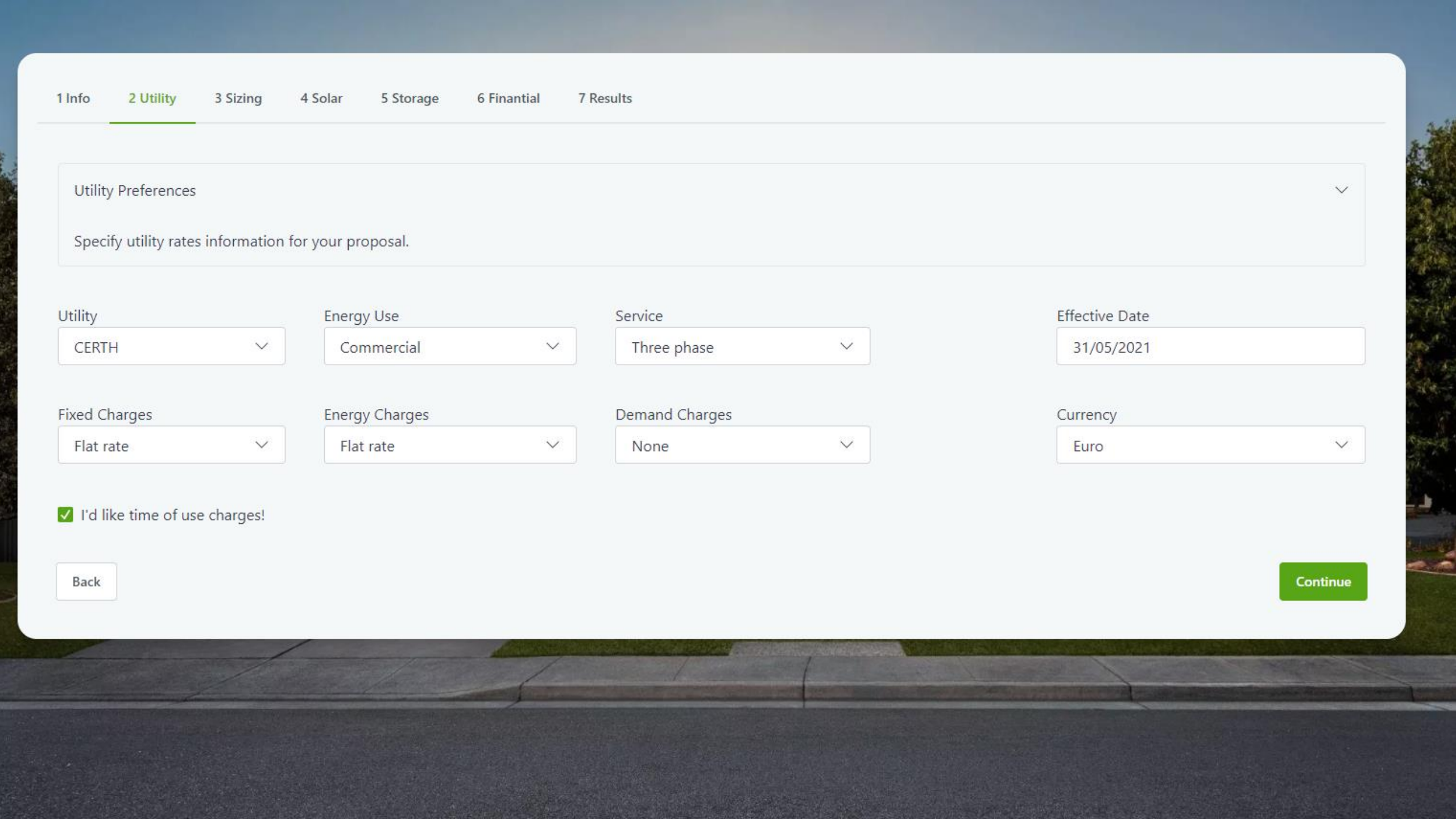
## Attach documents

Drop and Drag here

or

**Browser Files**

Continue



1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

Utility Preferences

Specify utility rates information for your proposal.

Utility: CERTH

Energy Use: Commercial

Service: Three phase

Effective Date: 31/05/2021

Fixed Charges: Flat rate

Energy Charges: Flat rate

Demand Charges: None

Currency: Euro

☑ I'd like time of use charges!

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1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Sizing

Introduce your control settings and quickly run an advanced simulation to determine the optimal system size of your project according to your economic + environmental goals. Set a target internal rate of return and/or a degree of energy self sufficiency. Visualize how your goals change according to solar and storage size then re-engineer and launch a new simulation.

Internal Rate of Return

6 %

Energy Self Sufficiency

50 %

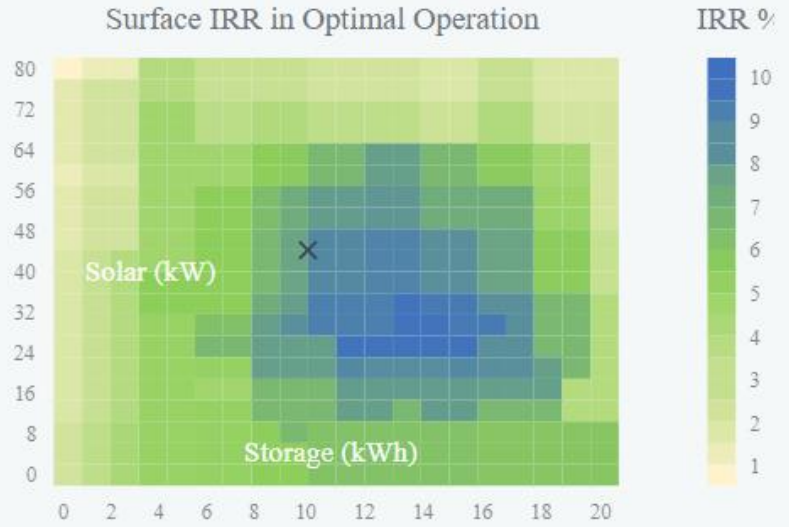
Peak Demand Level

Enabled

Energy Arbitrage

Enabled

Charging restrictions

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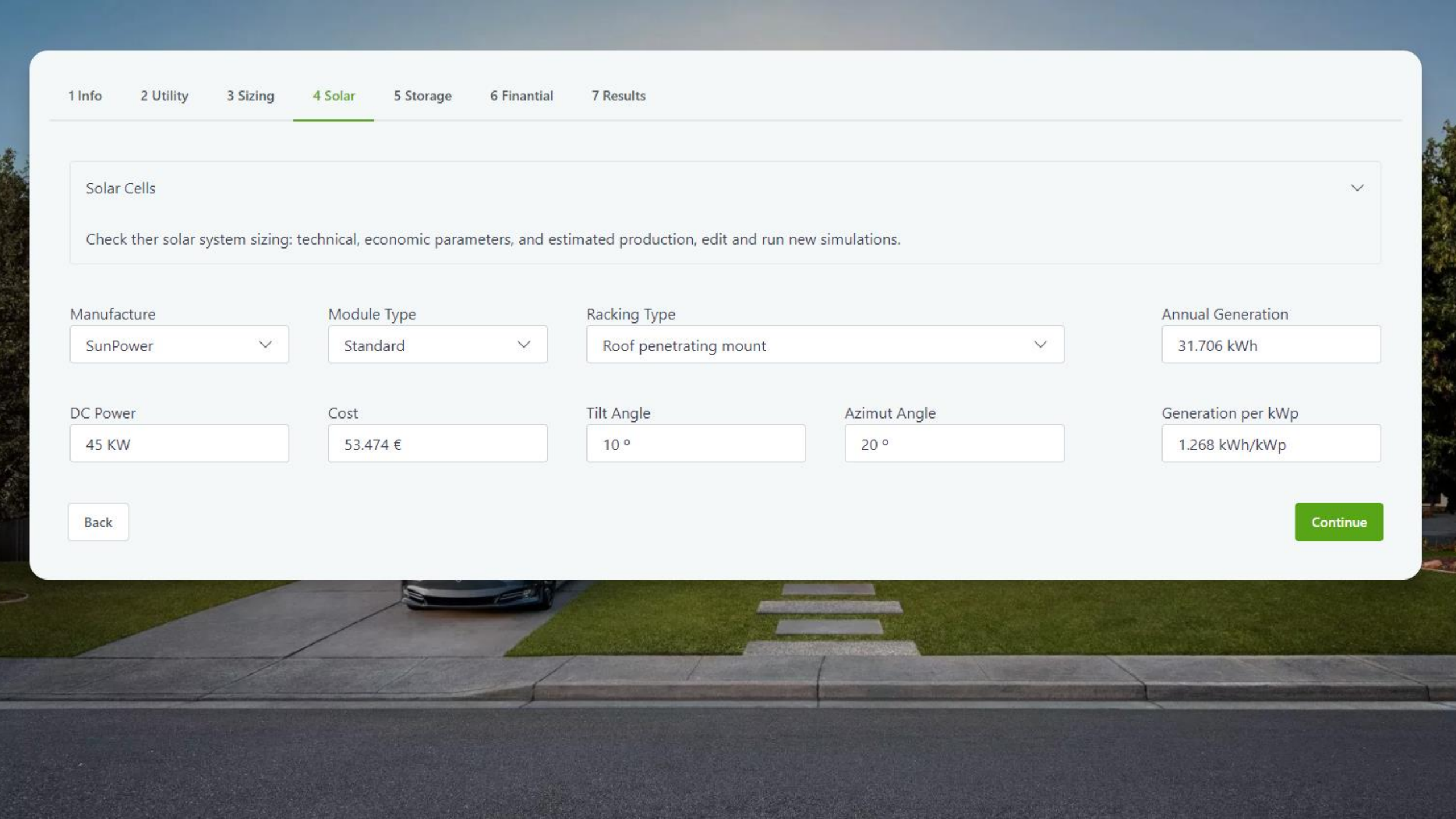

1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Solar Cells

Check ther solar system sizing: technical, economic parameters, and estimated production, edit and run new simulations.

| Manufacture | Module Type | Racking Type | Annual Generation |
|---|---|---|---|
| SunPower | Standard | Roof penetrating mount | 31.706 kWh |

| DC Power | Cost | Tilt Angle | Azimut Angle | Generation per kWp |
|---|---|---|---|---|
| 45 KW | 53.474 € | 10 ° | 20 ° | 1.268 kWh/kWp |

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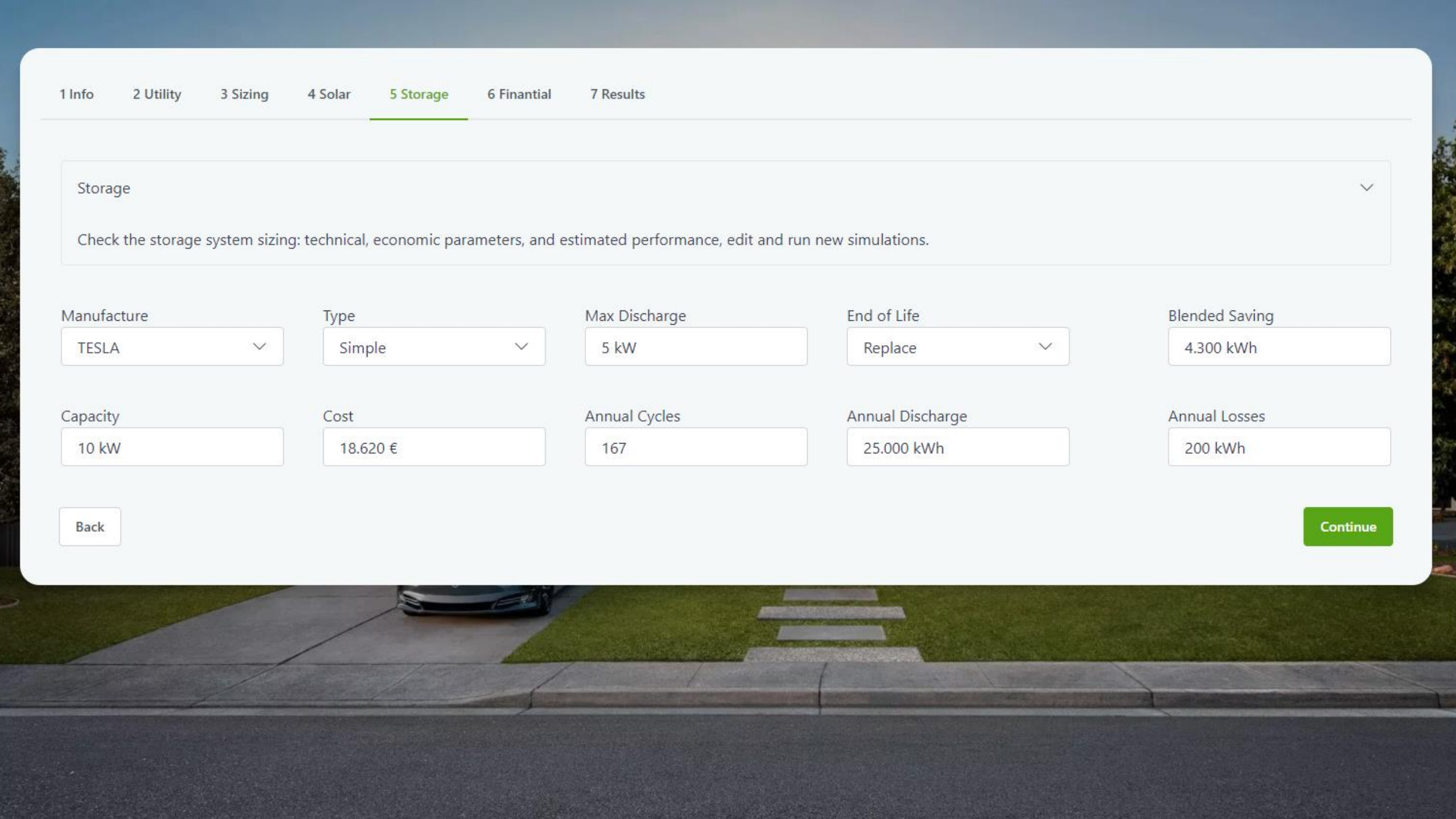

1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Storage

Check the storage system sizing: technical, economic parameters, and estimated performance, edit and run new simulations.

| Manufacture | Type | Max Discharge | End of Life | Blended Saving |
|---|---|---|---|---|
| TESLA | Simple | 5 kW | Replace | 4.300 kWh |

| Capacity | Cost | Annual Cycles | Annual Discharge | Annual Losses |
|---|---|---|---|---|
| 10 kW | 18.620 € | 167 | 25.000 kWh | 200 kWh |

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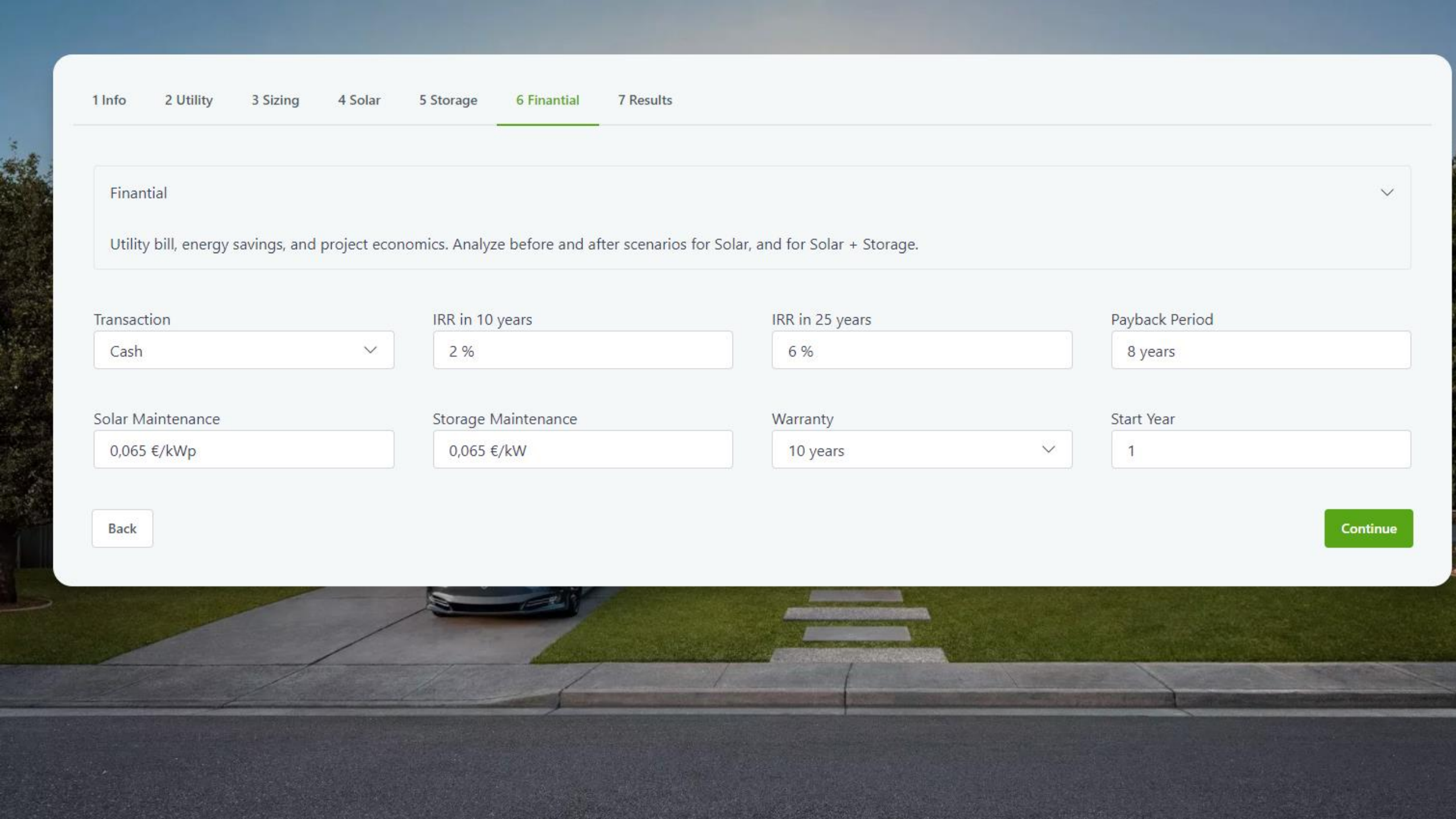

1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Finantial

Utility bill, energy savings, and project economics. Analyze before and after scenarios for Solar, and for Solar + Storage.

| | | | |
|---|---|---|---|
| Transaction: Cash | IRR in 10 years: 2 % | IRR in 25 years: 6 % | Payback Period: 8 years |
| Solar Maintenance: 0,065 €/kWp | Storage Maintenance: 0,065 €/kW | Warranty: 10 years | Start Year: 1 |

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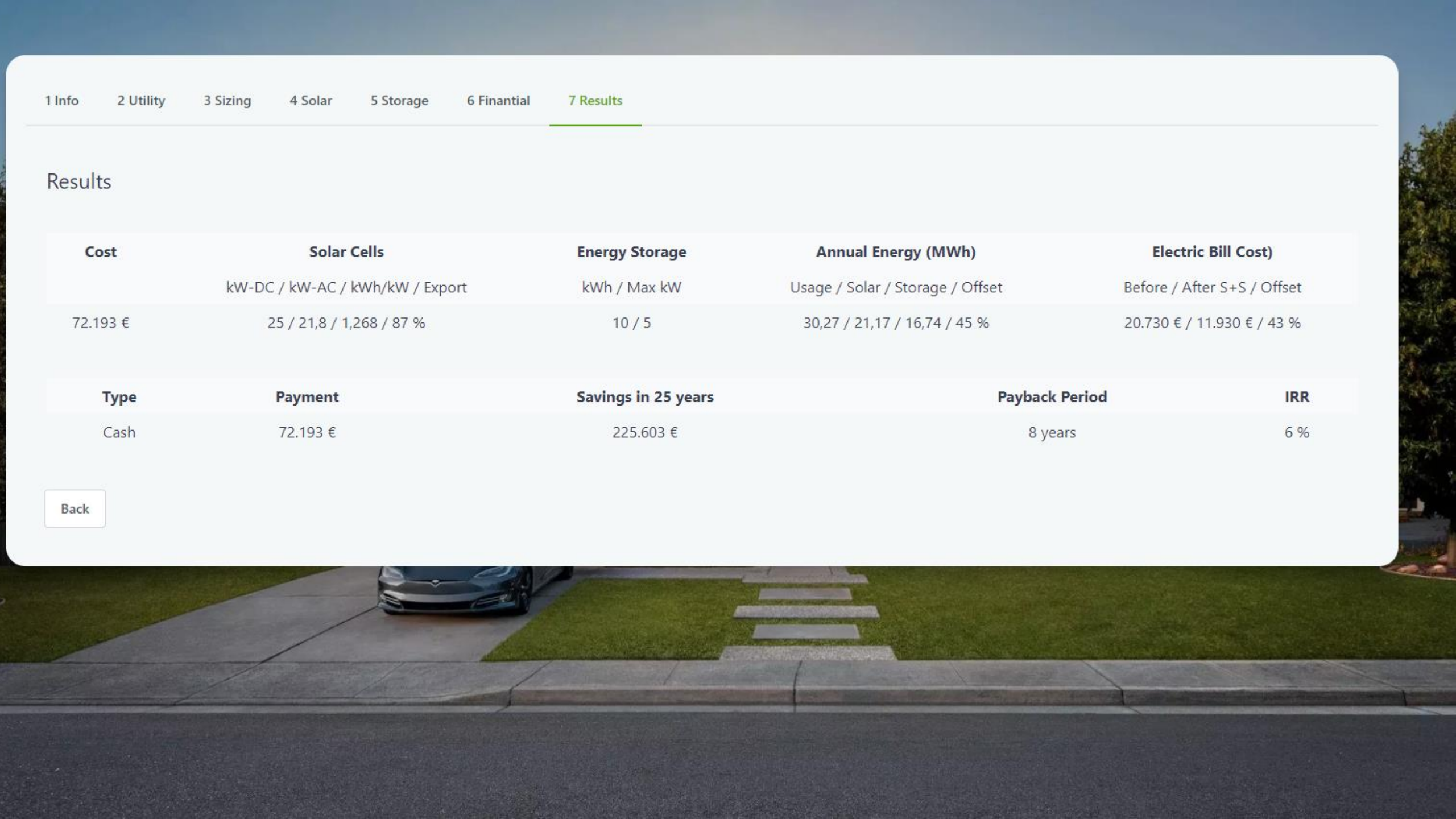

1 Info | 2 Utility | 3 Sizing | 4 Solar | 5 Storage | 6 Finantial | 7 Results

## Results

| Cost | Solar Cells | Energy Storage | Annual Energy (MWh) | Electric Bill Cost) |
|---|---|---|---|---|
| | kW-DC / kW-AC / kWh/kW / Export | kWh / Max kW | Usage / Solar / Storage / Offset | Before / After S+S / Offset |
| 72.193 € | 25 / 21,8 / 1,268 / 87 % | 10 / 5 | 30,27 / 21,17 / 16,74 / 45 % | 20.730 € / 11.930 € / 43 % |

| Type | Payment | Savings in 25 years | Payback Period | IRR |
|---|---|---|---|---|
| Cash | 72.193 € | 225.603 € | 8 years | 6 % |

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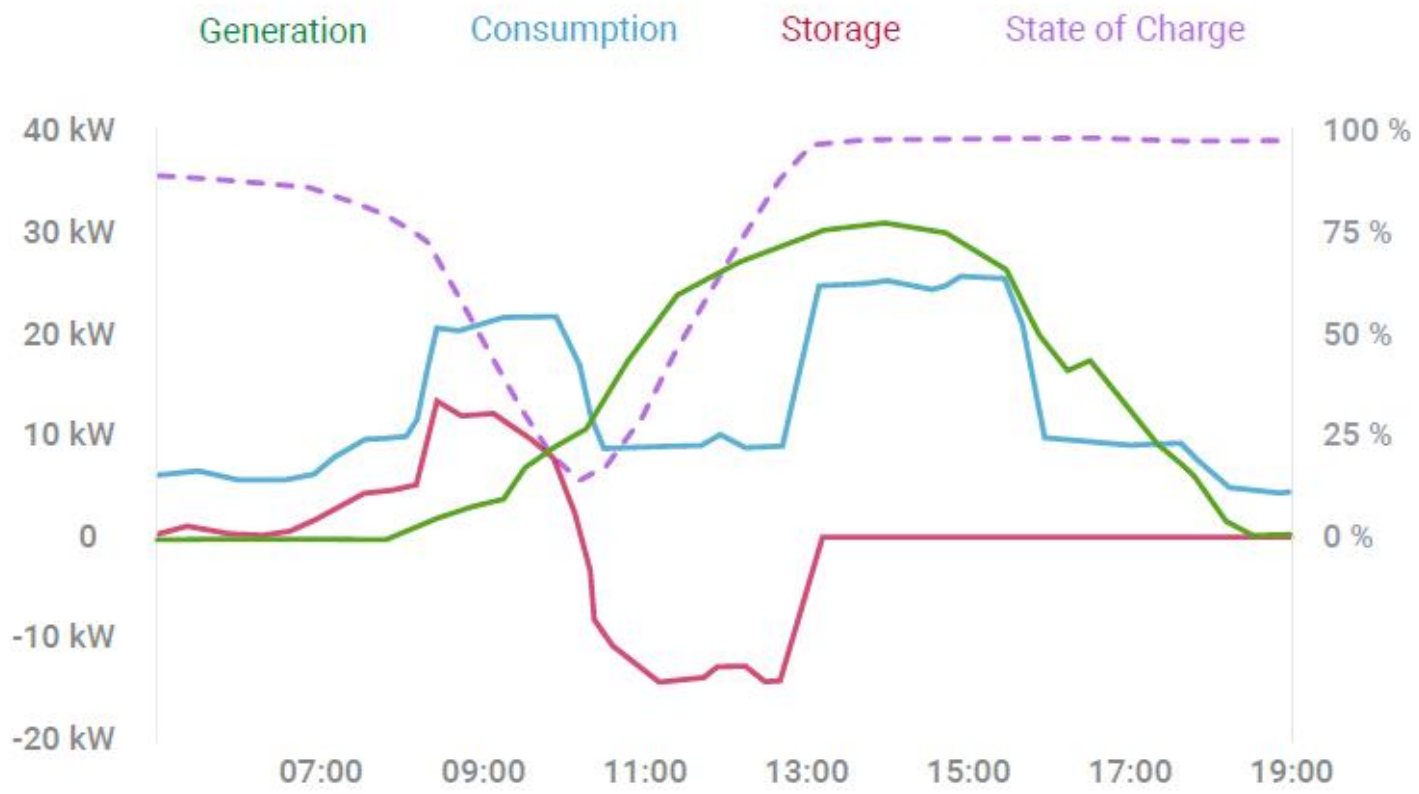
Proposal

Operation

Monitoring

## Site Profile




May

| Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

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