



Erfahrungen aus FSIGHT's live Energiegemeinschaft „Gilboa Iris“ in Israel

Juni 2020

Live integrated in ENERGY AI

PV residential

8 systems, 103 kW in total



PV large scale

18 systems, 1,140 kW in total



Wind turbine

1 turbine, 11 kW in total



Battery

5 system, 30 kWh in total



Smart appliances

Air conditioning systems

Simulated with ENERGY AI

Battery

10-20 systems, 245 kWh in total



Involved Players & their roles

Israel Electric company (IEC)

External Energy provider , covering surplus & deficit electricity of the community via one main grid connection.

Maale Gilboa Kibbutz

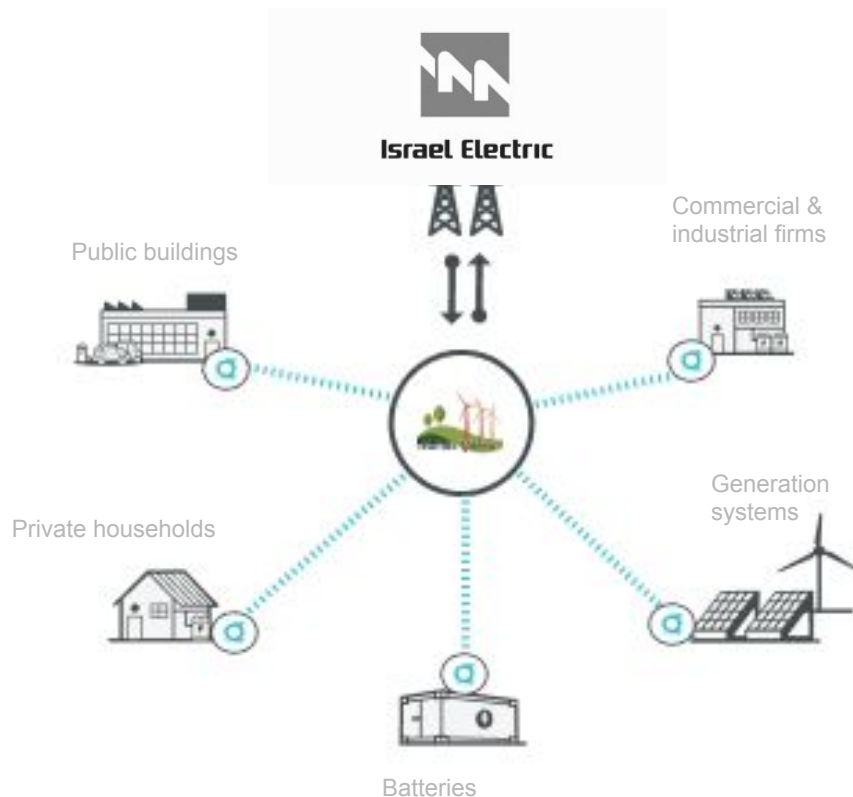
Local energy supplier and DSO for private community grid. Partly owns distributed energy resources.

FSIGHT

Provides “ENERGY AI” - Community optimization/management platform.

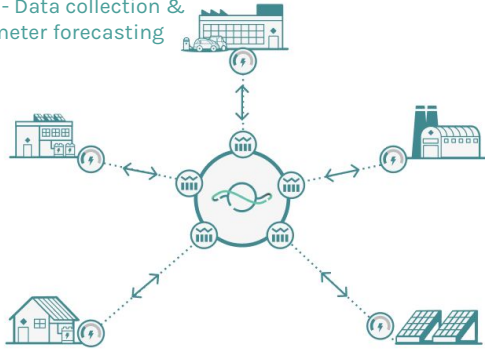
Community member

The Kibbutz consists of more than 200 members, whereas some have energy production and/or storage assets installed on their own premises and others have access to shared assets. Members receive one electricity bill from Maale Gilboa based on time-of-use tariff.



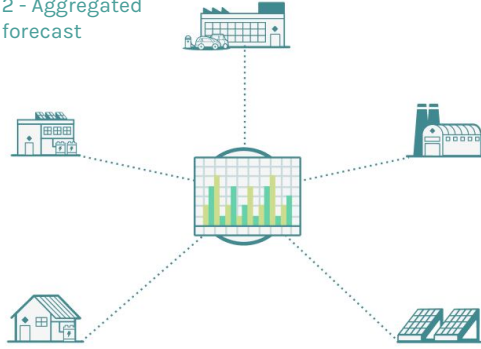
ENERGY AI - Local Community Market Operation

1 - Data collection & meter forecasting



Smart meter data is collected and a consumption and generation forecast is created for every smart agent.

2 - Aggregated forecast



All the forecasts are combined to create an aggregated supply & demand curve for the entire community.

3 - Local price curve



Local price curve is created based on the external price, community price and local supply & demand ratio.

4 - Price signaling



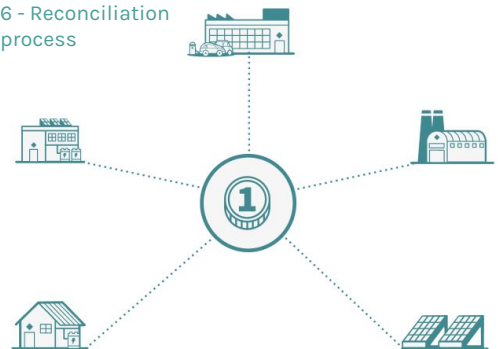
The price curve is broadcasted in series to each smart agent. Every smart agent in it's turn returns an optimized action plan and the price curve is updated accordingly.

5 - Optimized action plan



Optimized action plans are executed by the smart agents who operate the different flexible assets. The aggregation of these actions balances the local supply and demand curves.

6 - Reconciliation process



A reconciliation process makes sure every community member is reimbursed according to his actual contribution to the community.

Gilboa Iris - RESULTS highlights



20%
COST SAVINGS

35%
SELF SUFFICIENCY

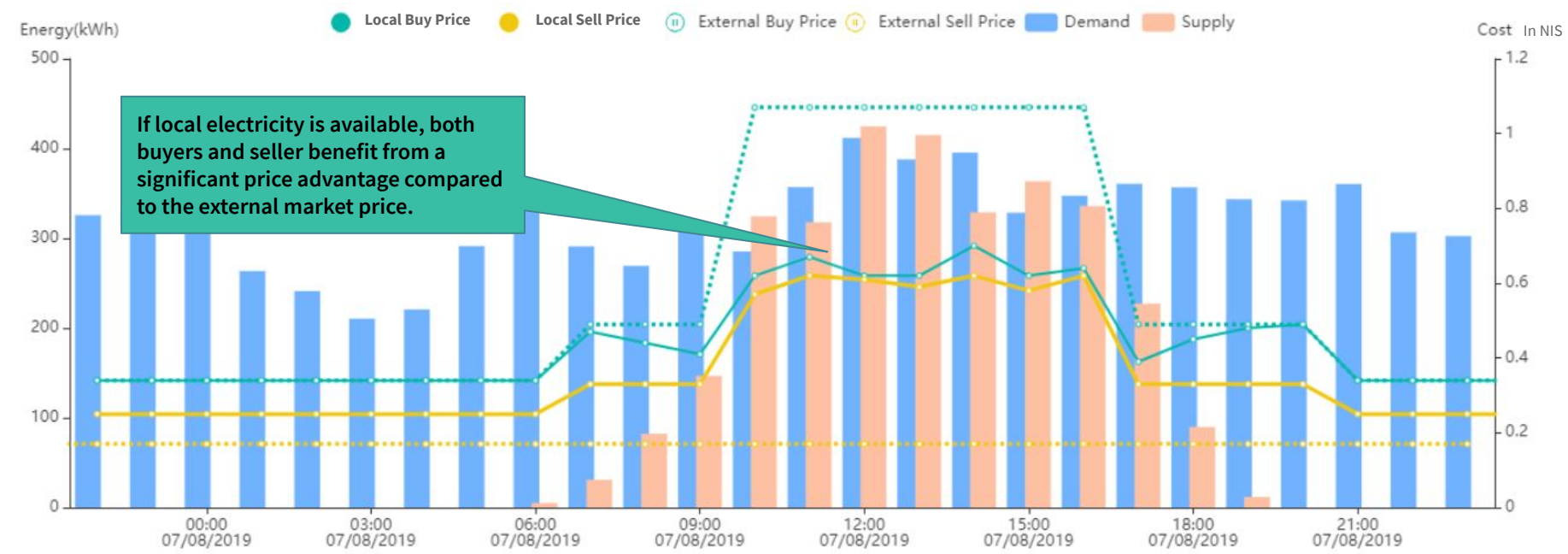
90%
PRODUCTION
CONSUMED LOCALLY

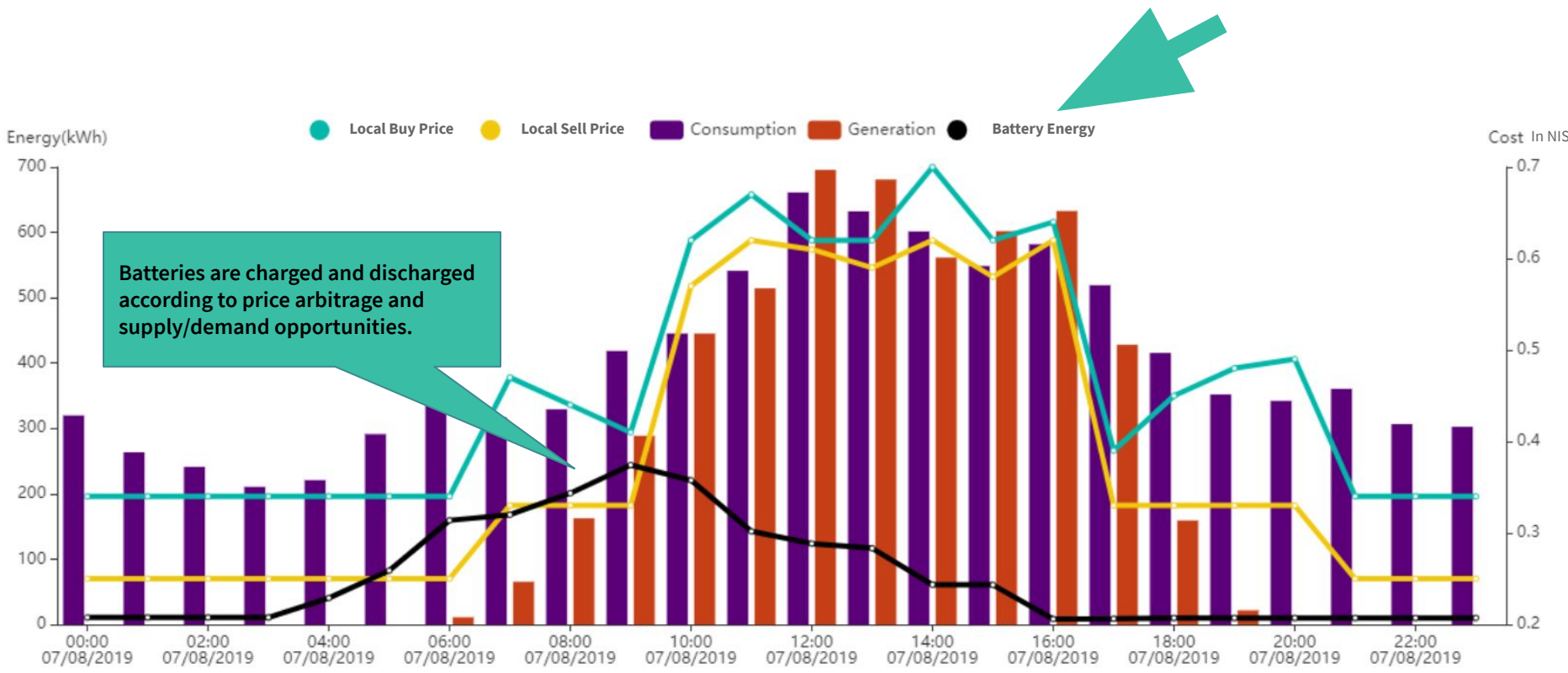
Match Demand with Supply through local trading and flexibility optimization

Avoid grid costs and enjoy price spread



Dedicated local pricing mechanism for community transactions



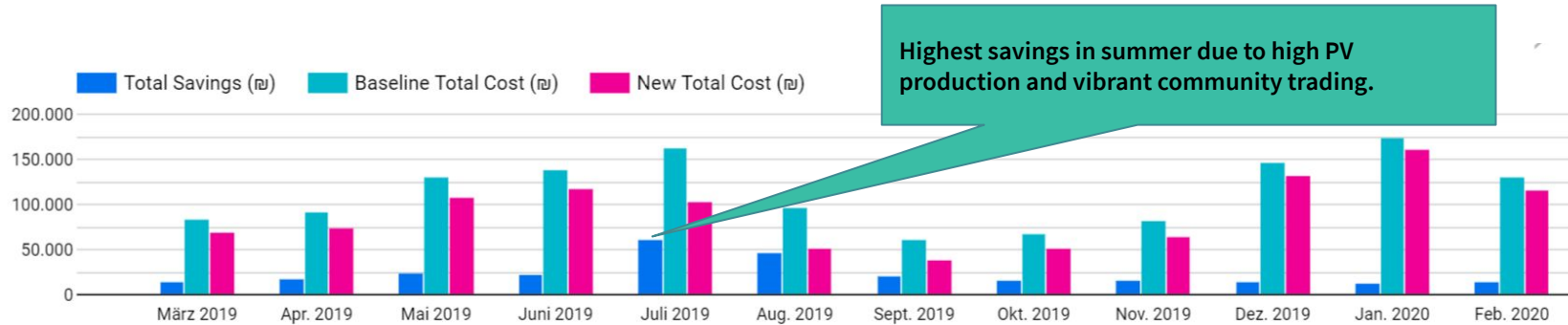


20% cost savings by introducing energy community optimization

Baseline Total Cost (€)
1.368.314

New Total Cost (€)
1.087.806

Cost Savings (%)
20%



Decrease in buying costs for Community Members WITHOUT PV

Baseline Total Cost (€)
1.472.176

New Total Cost (€)
1.278.077

Total Savings (€)
194.099

Cost Decrease (%)
13%

*Previous Total Cost - New Total Cost

Increase in selling revenue for Community Members WITH PV

Baseline Total Cost (€)
-103.861

New Total Cost (€)
-190.271

Total Savings (€)
86.410

Revenue Increase (%)
83%

*Previous Total Cost - New Total Cost

Increase of self-sufficiency and use of locally generated electricity

Single Site View



Single Sites (Aggregated values)

$$\begin{array}{|c|} \hline \text{Consumption (kWh)} \\ \hline 3.893.300 \\ \hline \end{array} - \begin{array}{|c|} \hline \text{Self Consumption (kWh)} \\ \hline 547.580 \\ \hline \end{array} = \begin{array}{|c|} \hline \text{External Demand (kWh)} \\ \hline 3.346.073 \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline \text{Production (kWh)} \\ \hline 1.537.028 \\ \hline \end{array} - \begin{array}{|c|} \hline \text{Self Consumption (kWh)} \\ \hline 547.580 \\ \hline \end{array} = \begin{array}{|c|} \hline \text{External Supply (kWh)} \\ \hline 1.035.870 \\ \hline \end{array}$$

Consumption self produced (%)
14,06 %
*Self Consumption / Consumption

How much of energy the sites consume is produced behind their own meters

Production self consumed (%)
35,63 %
*Self Consumption / Production

How much of energy the sites produce is consumed behind their own meters

Community Effect



+21%

Single Sites including Community trading (Aggregated values)

$$\begin{array}{|c|} \hline \text{Self Consumption (kWh)} \\ \hline 547.580 \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Community Consumption (kWh)} \\ \hline 802.982 \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Total Local Consumption (kWh)} \\ \hline 1.350.563 \\ \hline \end{array}$$

Consumption produced locally (%)
34,69 %
*Total Local Consumption / Consumption

How much of energy the community consumes is produced locally

$$\begin{array}{|c|} \hline \text{Self Production (kWh)} \\ \hline 547.580 \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Community Production (kWh)} \\ \hline 1.035.870 \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Total local Production (kWh)} \\ \hline 1.537.028 \\ \hline \end{array}$$

Production consumed locally
87,87 %
*Total Local Consumption / Production

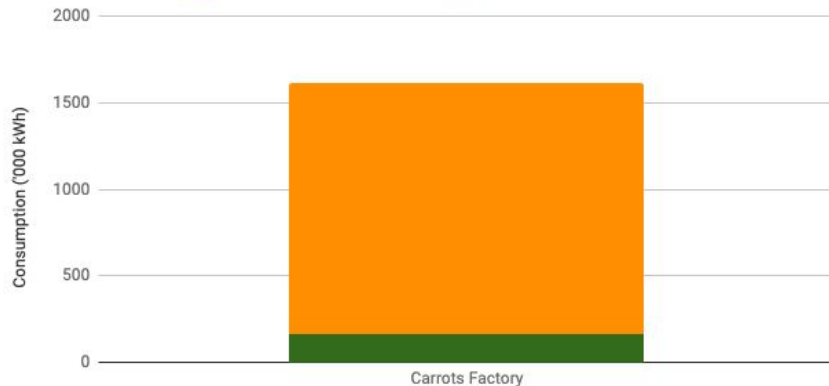
How much of energy the community produces is consumed locally

*Consumption from single sites include external import energy, total local consumption, when forming a community, only includes local energy

+52%

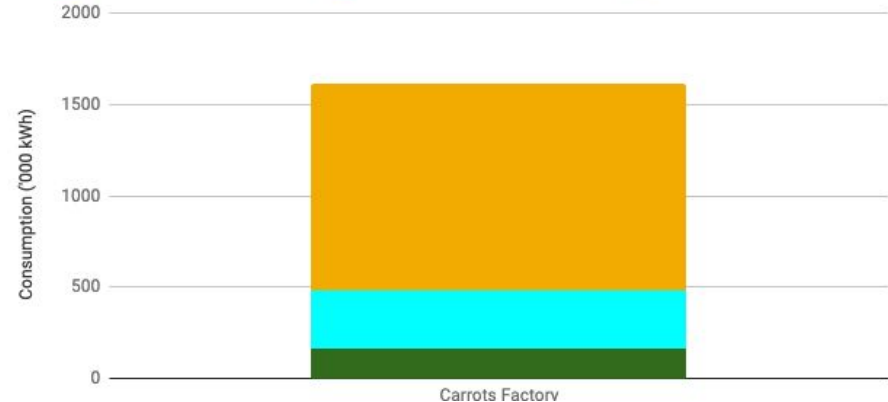
Example Carrot Factory - Single Site View

External consumption (kWh) Self consumption (kWh)



Example Carrot Factory - Community View

External consumption (kWh) Community consumption (kWh) Self consumption (kWh)





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The image shows a vast field of solar panels stretching towards the horizon. The sun is low on the horizon, creating a warm, golden glow and long shadows across the panels. The sky is filled with scattered clouds, some of which are illuminated by the setting or rising sun. The overall scene conveys a sense of clean, renewable energy.

 FSIGHT