



Techno-economic assessment of a third-party ownership power purchase agreement model for residential rooftop photovoltaics in Egypt Supplementary Material

Residential electricity tariff

Total monthly consumption (kWh)	Tier	Consumption (kWh)	Tariff rate EGP/kWh	Tariff rate USD c/kWh	Bill calculation
0 to 100	1	0 to 50	0.68	1.36	Tier 1 kWh consumption*0.68
	2	51 to 100	0.78	1.56	Tier 2 kWh consumption *0.78
101 to 650	3	0 to 200	0.95	1.9	Tier 3 kWh consumption *0.95
	4	201 to 350	1.55	3.1	Tier 4 kWh consumption *1.55
	5	351 to 650	1.95	3.9	Tier 5 kWh consumption *1.95
More than 650	6	0 to 1000	2.1	4.2	Tier 6 kWh consumption *2.1
More than 1000	7	0 to more than 1000	2.23	4.46	Tier 7 kWh consumption *2.23

(EgyptERA, n.d.)

Business models

Self-ownership

The building/rooftop owner purchases and owns the PV system primarily to generate electricity for their own use and may sell excess to the grid (Greentech Renewables, 2016).

Community solar

Solar electricity generated at one location is to be credited against the electricity consumption at different locations owned or associated with the same customer or group (NREL, n.d.).

Third-party ownership/ Solar leasing

Customer leases a solar energy system from a third-party provider (usually a solar company) instead of purchasing it outright (Tongsopit et al., 2016).

Third-party ownership/ Power purchase agreement

A solar provider installs and retains ownership of the PV system. The customer purchases the generated electricity at a predetermined, often reduced, rate without any upfront investment (Kiwi Solar, n.d.).

Store on grid

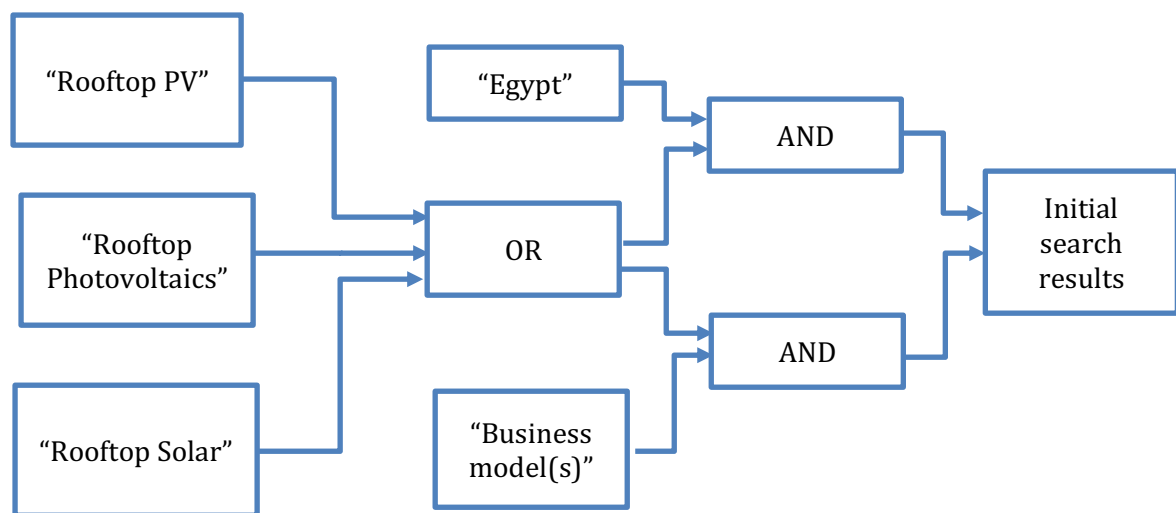
It is a rooftop PV approach where excess solar electricity is either stored in batteries or exported to the grid at a pre-determined storing rate, allowing the grid to act as a “virtual battery” (Mukisa et al., 2020).

Peer to peer

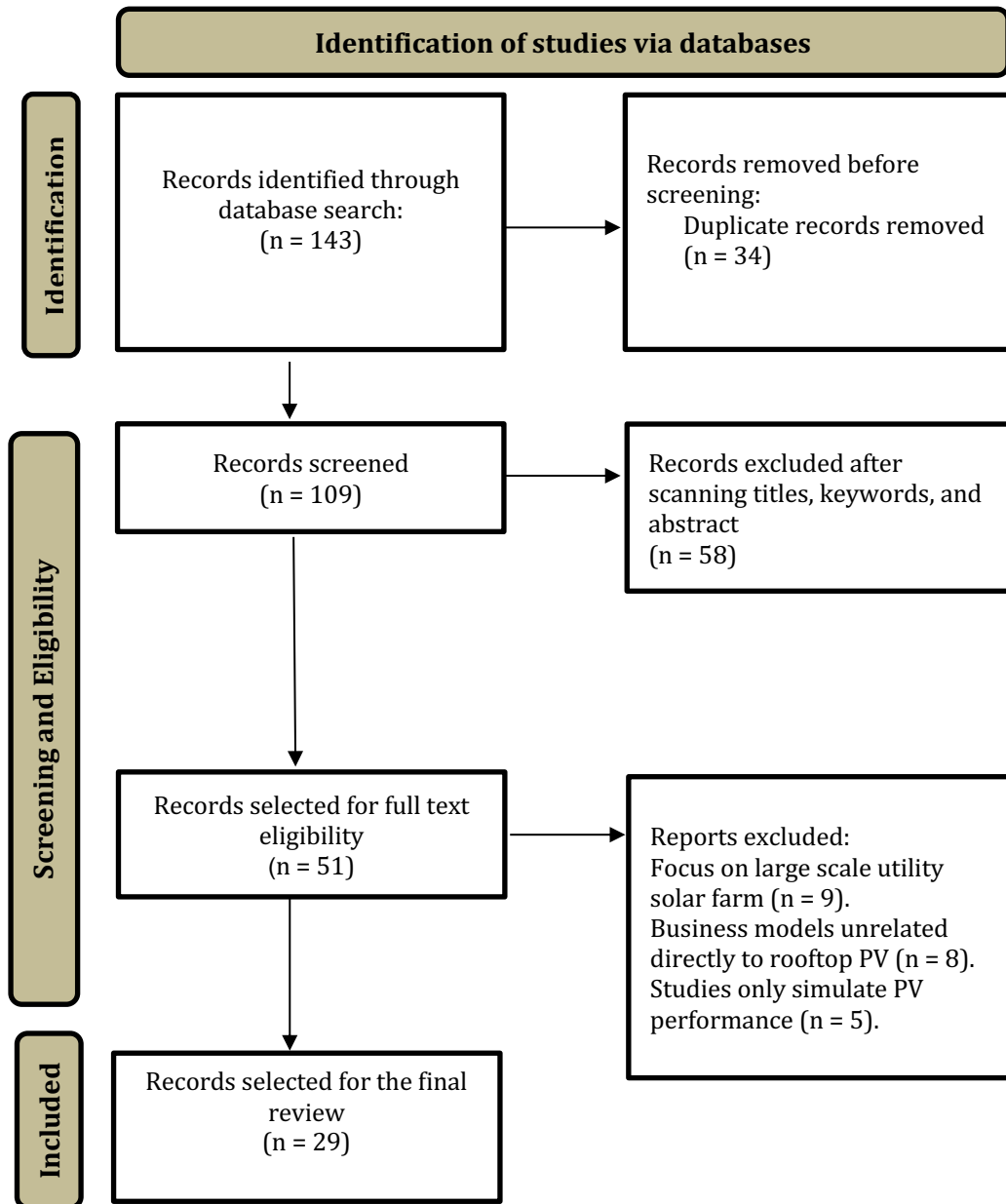
It is a rooftop PV business model where prosumers (those who both produce and consume electricity) can sell their excess solar power directly to nearby consumers through a digital platform, instead of only exporting it to the utility (Klein et al., 2019).

Equity- focused

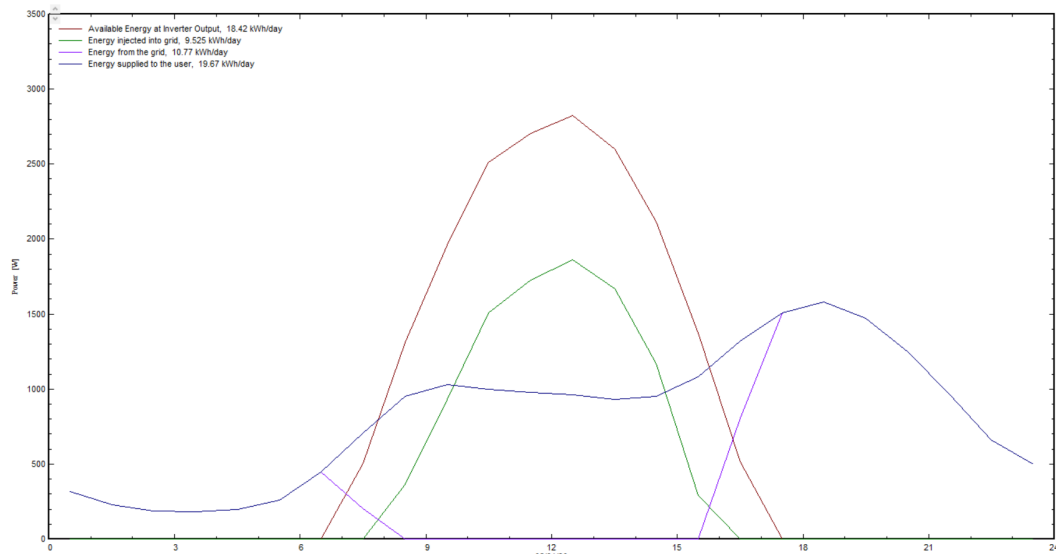
Allows investors or stakeholders to acquire ownership shares in a project, sharing both the financial risks and profits from electricity generation (O'Shaughnessy et al., 2021).



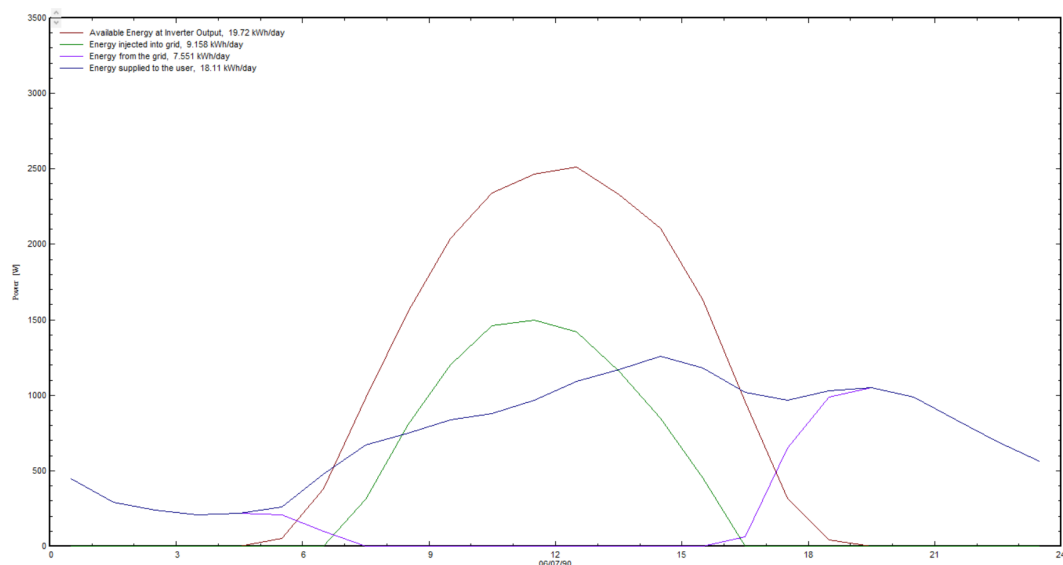
Literature review keywords search strategy



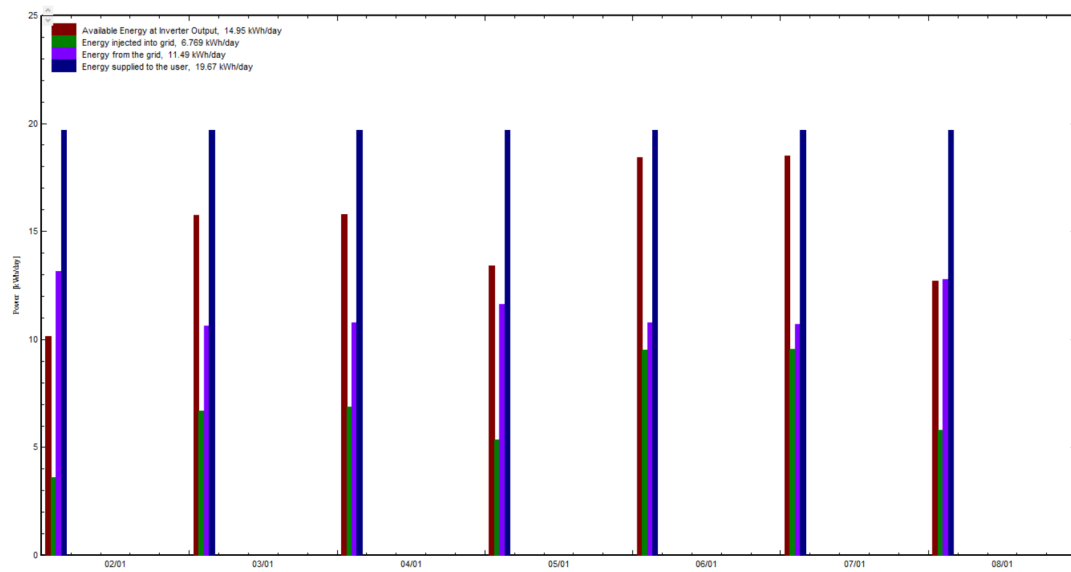
Literature review PRSIMA flow diagram



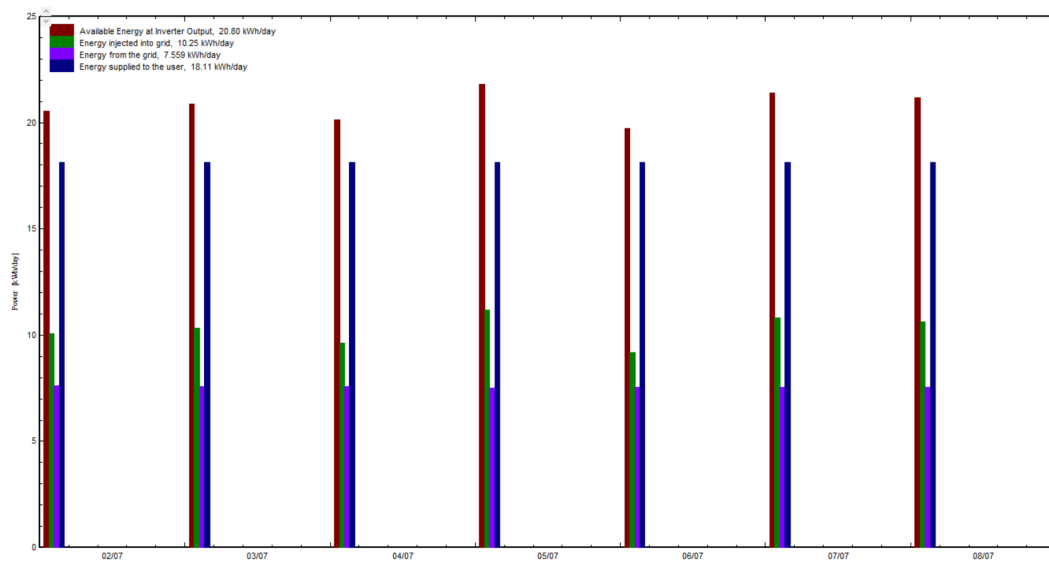
Medium consumption daily energy production and consumption (Winter)



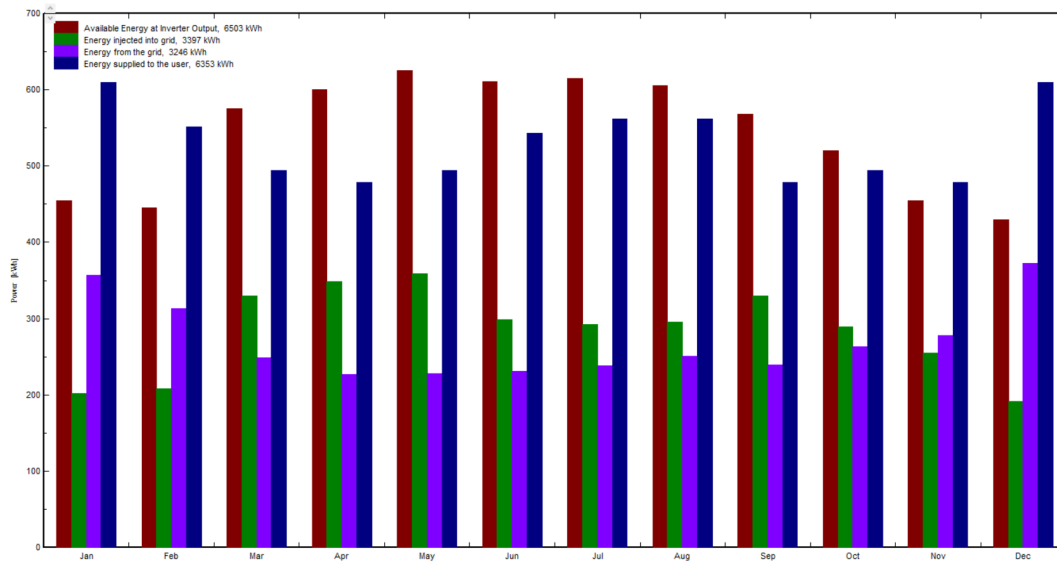
Medium consumption daily energy production and consumption (Summer)



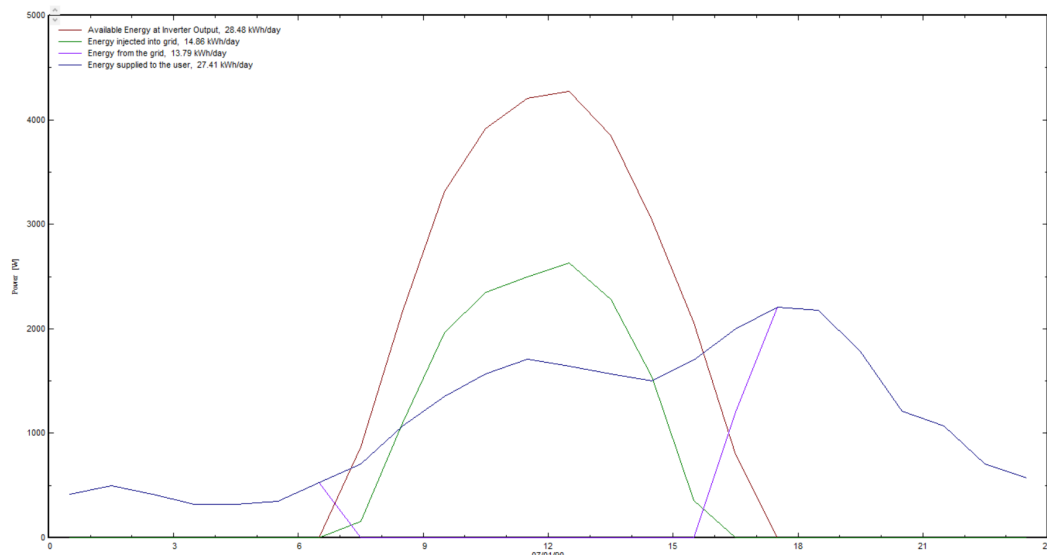
Medium consumption weekly energy production and consumption (Winter)



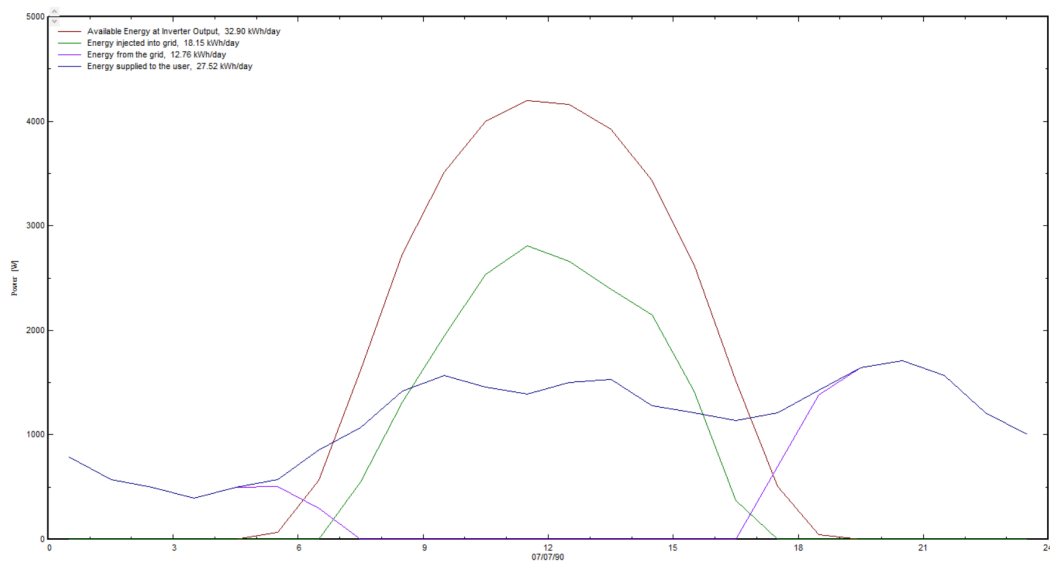
Medium consumption weekly energy production and consumption (Summer)



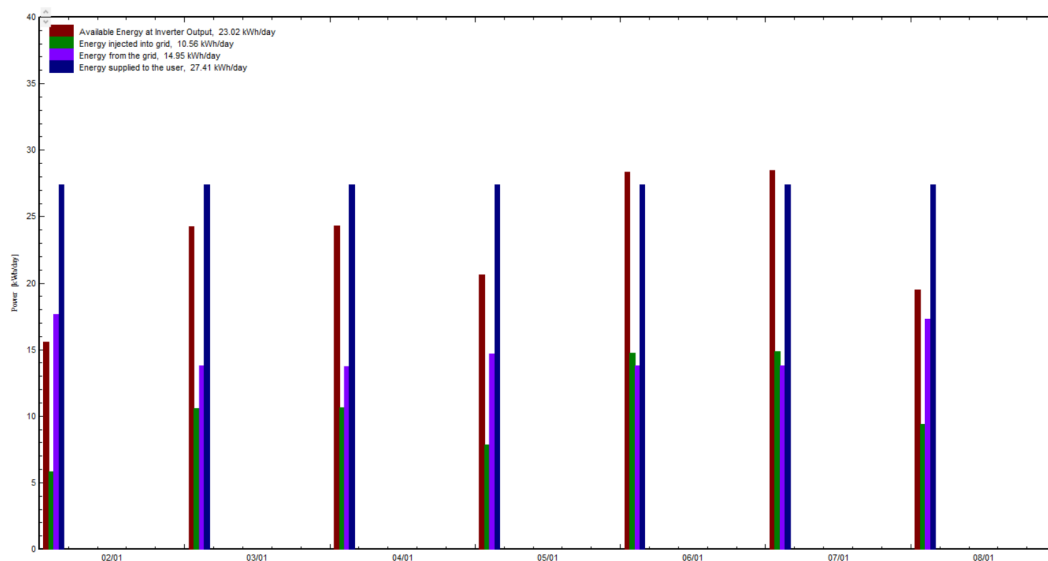
Medium consumption monthly energy production and consumption



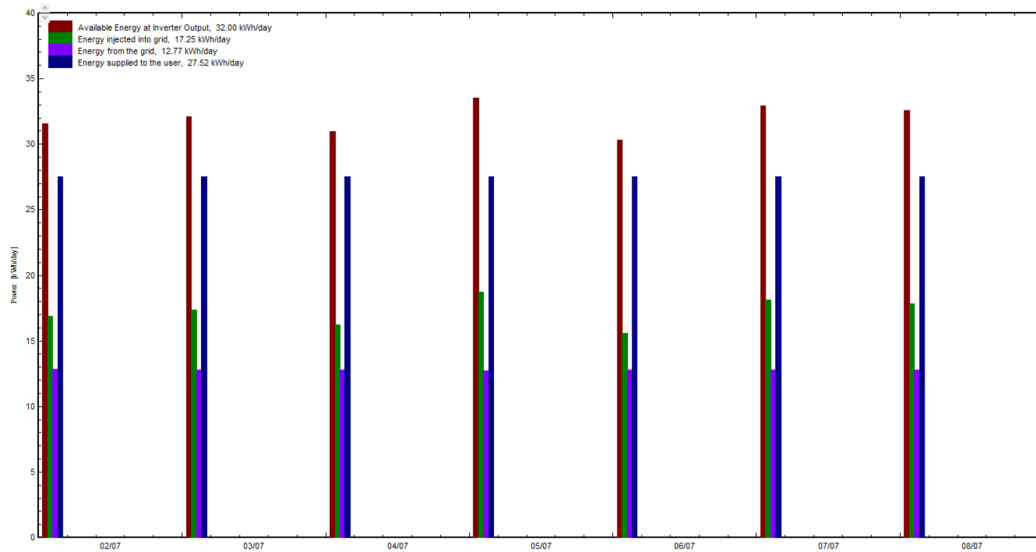
High consumption "A" daily energy production and consumption (Winter)



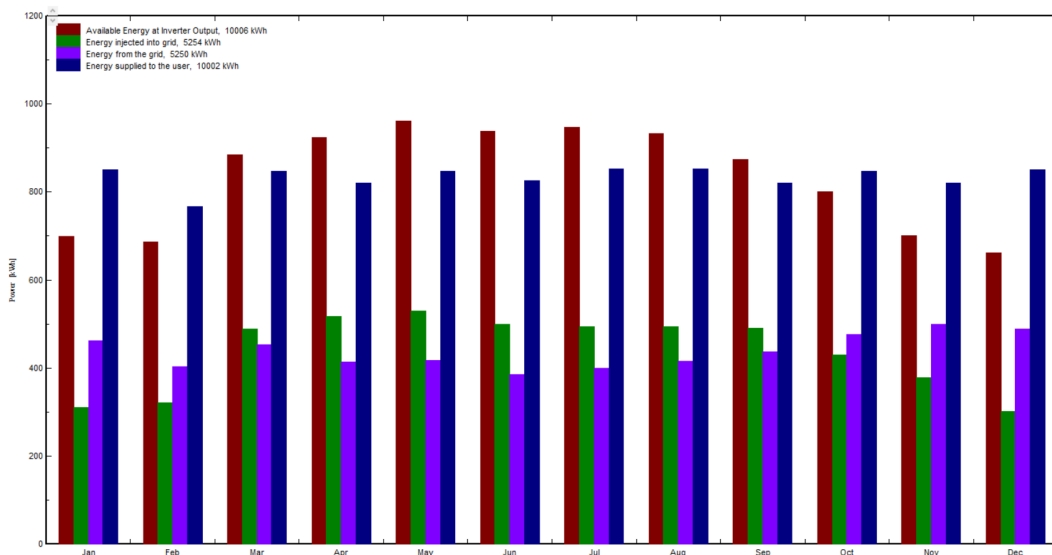
High consumption "A" daily energy production and consumption (Summer)



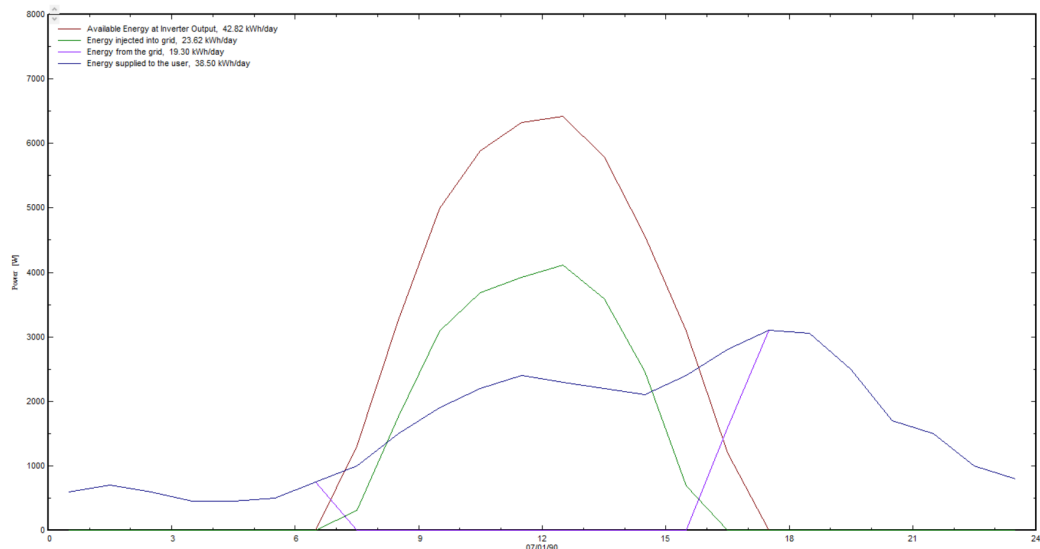
High consumption "A" weekly energy production and consumption (Winter)



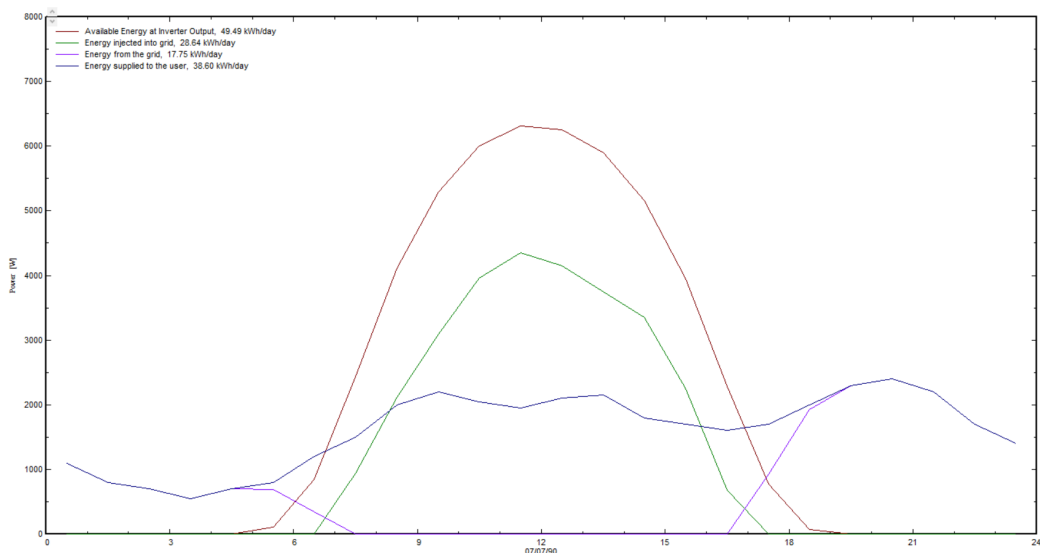
High consumption "A" weekly energy production and consumption (Summer)



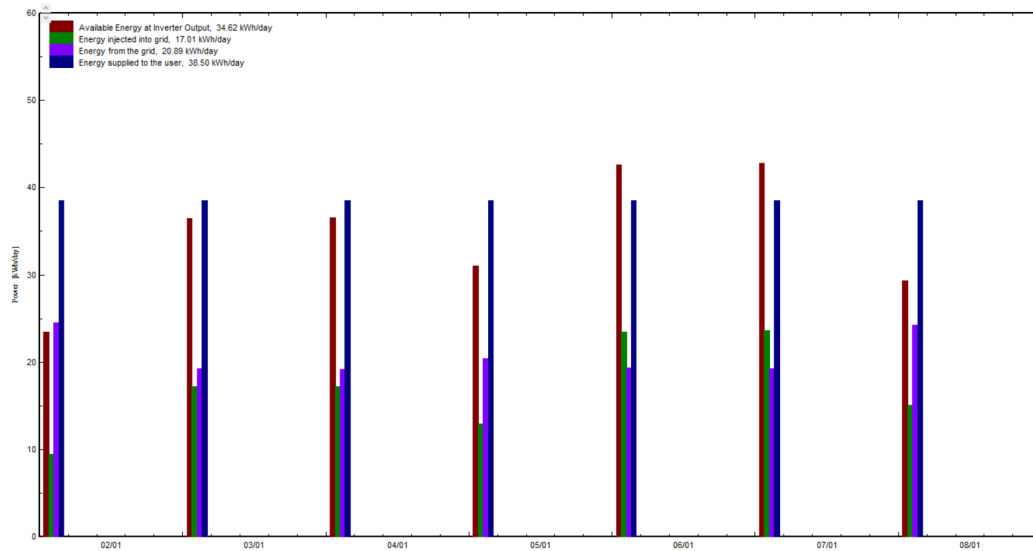
High consumption "A" monthly energy production and consumption



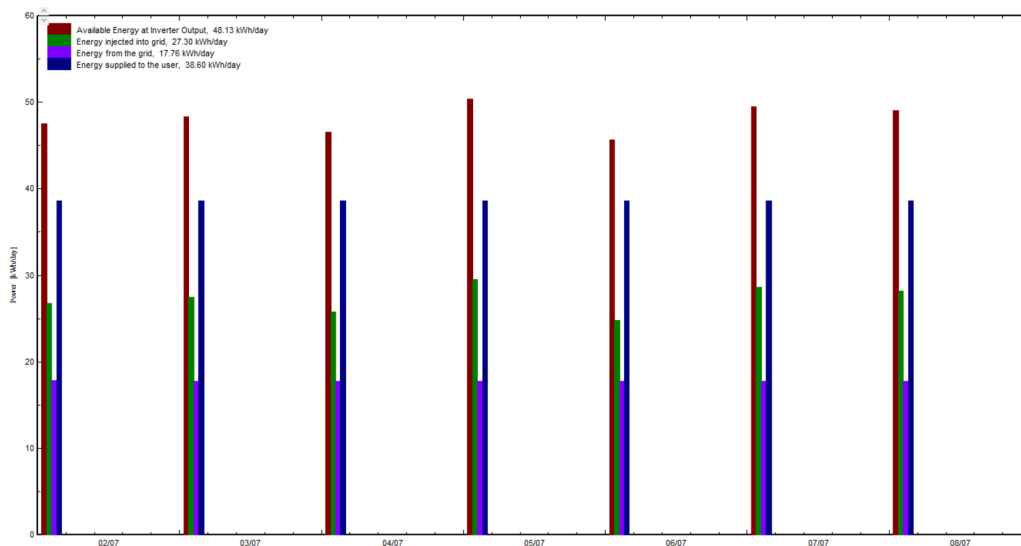
High consumption "B" daily energy production and consumption (Winter)



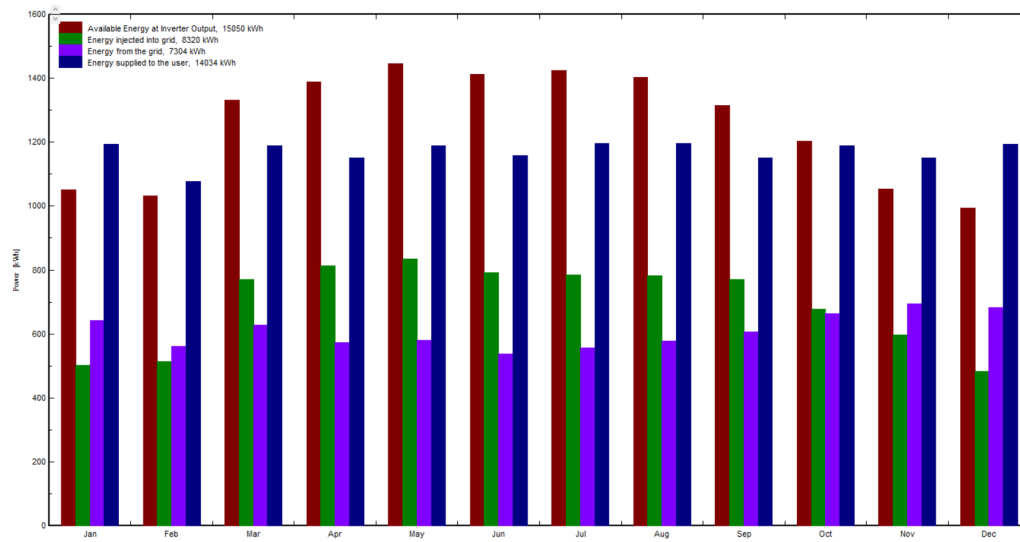
High consumption "B" daily energy production and consumption (Summer)



High consumption “B” weekly energy production and consumption (Winter)



High consumption “B” weekly energy production and consumption (Summer)



High consumption “B” monthly energy production and consumption