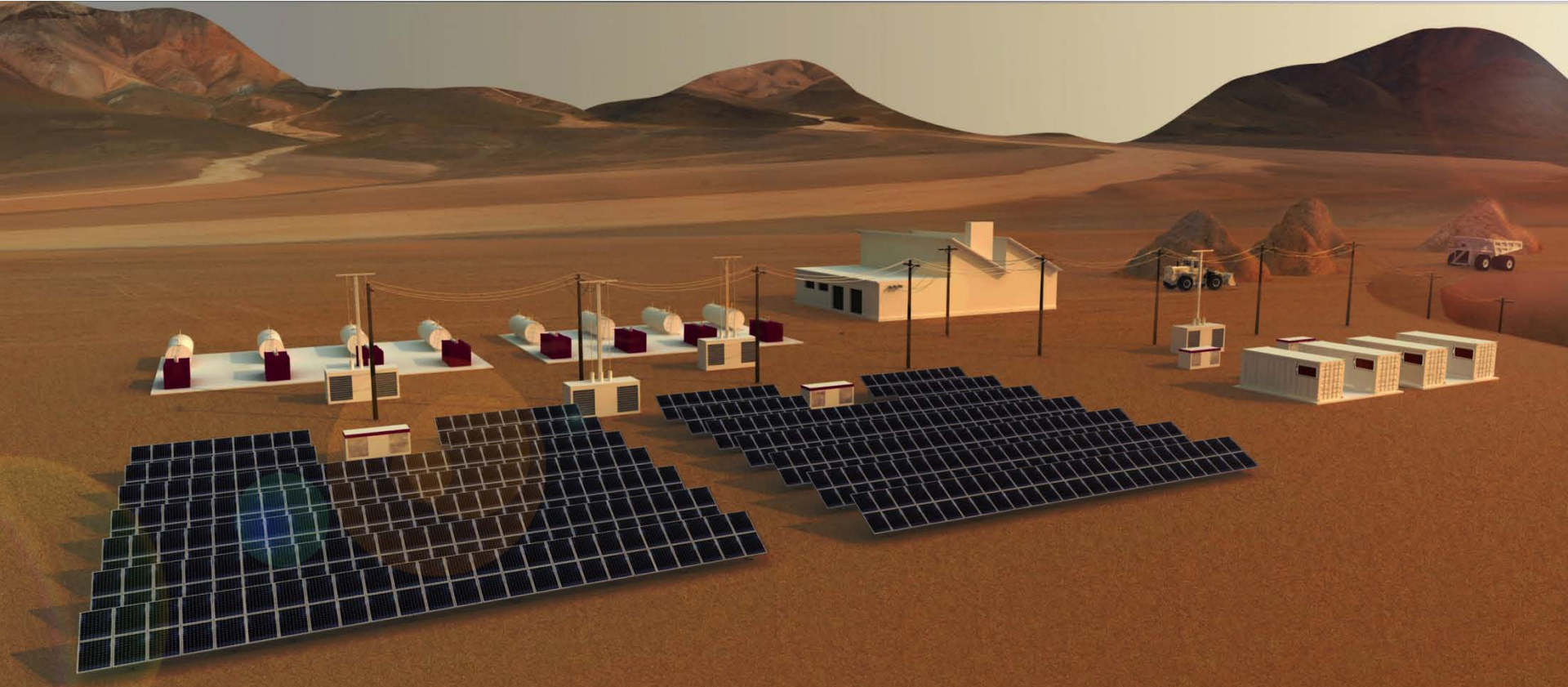


PV-Diesel Solutions for Commercial Applications



Content



Introduction juwi group

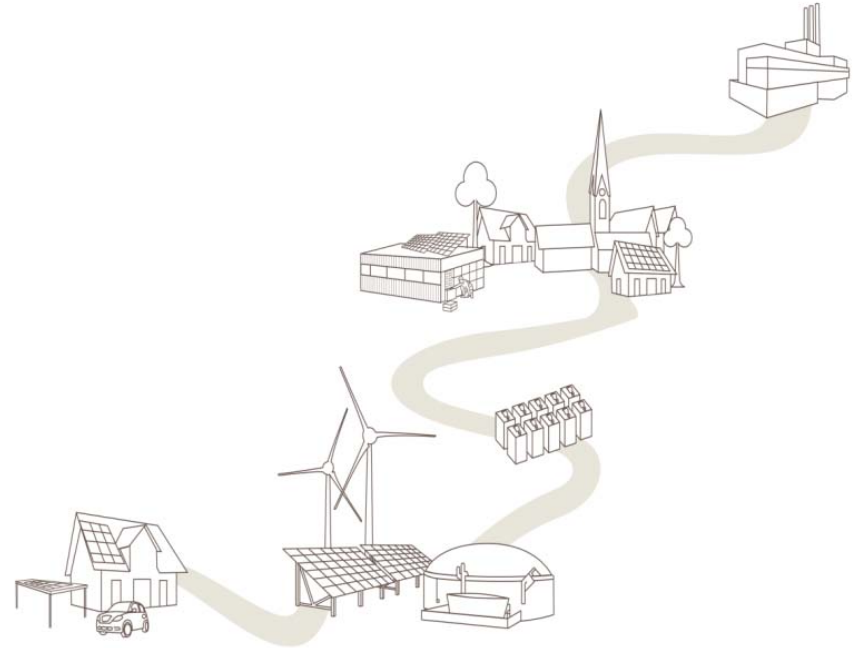
Solar Fuel Saver Applications

Low and high Penetration Topologies

Business Concepts

Our Offer: pre-feasibility study

References



juwi at a Glance



Company structure

- Founded in 1996 by Fred Jung and Matthias Willenbacher (juwi), pioneers for renewable energies with agricultural roots
- juwi AG is an owner-managed group of companies and not listed on the stock exchange

Total capacity

Around 3,000 Megawatt (approx. 2,300 systems)

Annual energy output

>5 billion kilowatt-hours, corresponds to the annual power demand of around 1.4 million households

Investment volume (since 1996)

> 6 billion USD

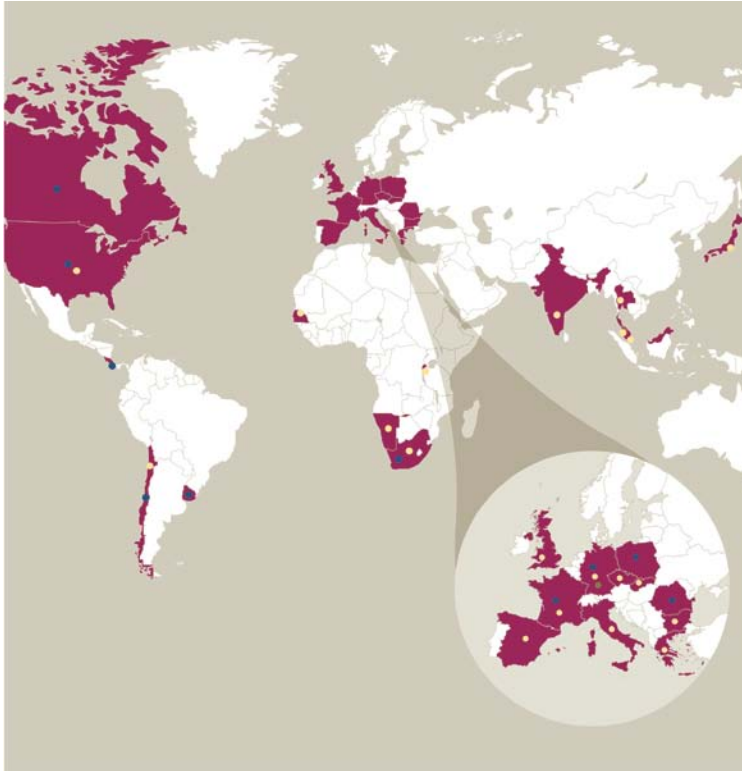
Employees & turnover

Approx. 1,500 employees (worldwide)
> 1 billion USD in 2013



juwi headquarters in Wörrstadt

International Offices



Europe

Germany, France, Great Britain, Italy, Greece, Czech Republic, Poland, Bulgaria

Africa

South Africa

Mena

Dubai

Americas

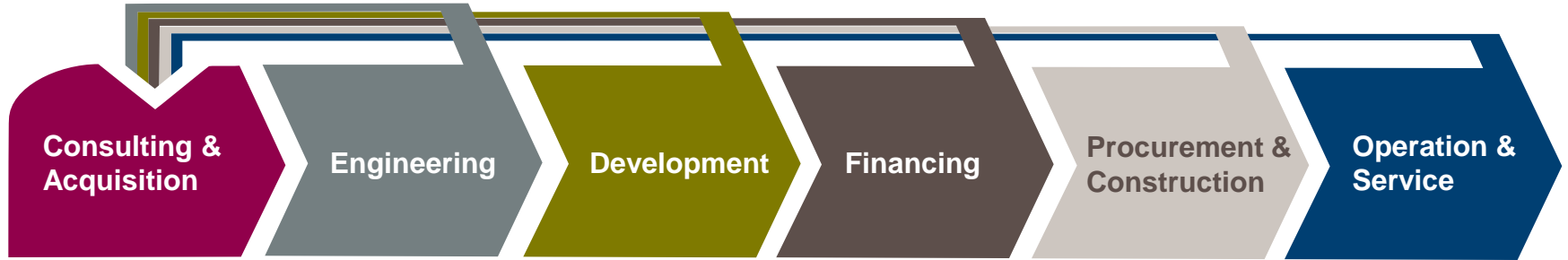
USA/Canada, Costa Rica, Chile

Asia

India, Singapore, Malaysia, Thailand, Japan
Australia

Our Business Activities

from Site Selection to Energy Production



Securing economic efficiency: With precise projects we help our partners to get ready for the future.

We strengthen regional economic power – on a long term basis!

Goal-oriented integration: We can make use of and combine all types of renewable energy. We combine the interests of all those involved!

Providing independence: Our decentralized solutions provide independence for communities, industrial businesses and individuals, independent from fluctuant prices, expensive energy imports and monopolies.

On-grid references

3000 MW installed capacity



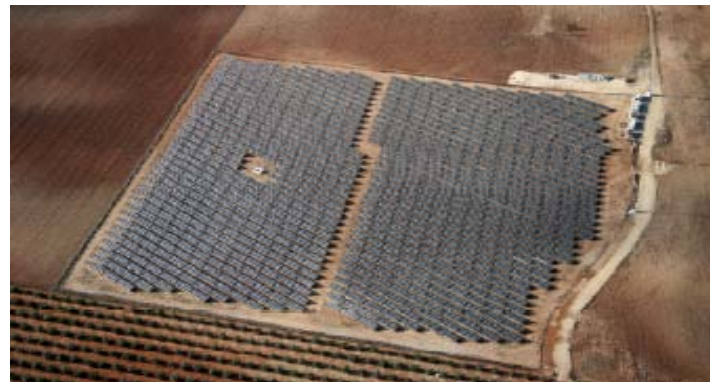
52,79 MW free-field installation, Lieberose (Brandenburg)



50 MW, Wind farm in Costa Rica



10 MW, Wind farm Wörrstadt



2 MW, El Cura (Spain)

Off-grid References



Wind-Solar-Diesel-Battery System, Egypt



Mini-Grid, Tanzania

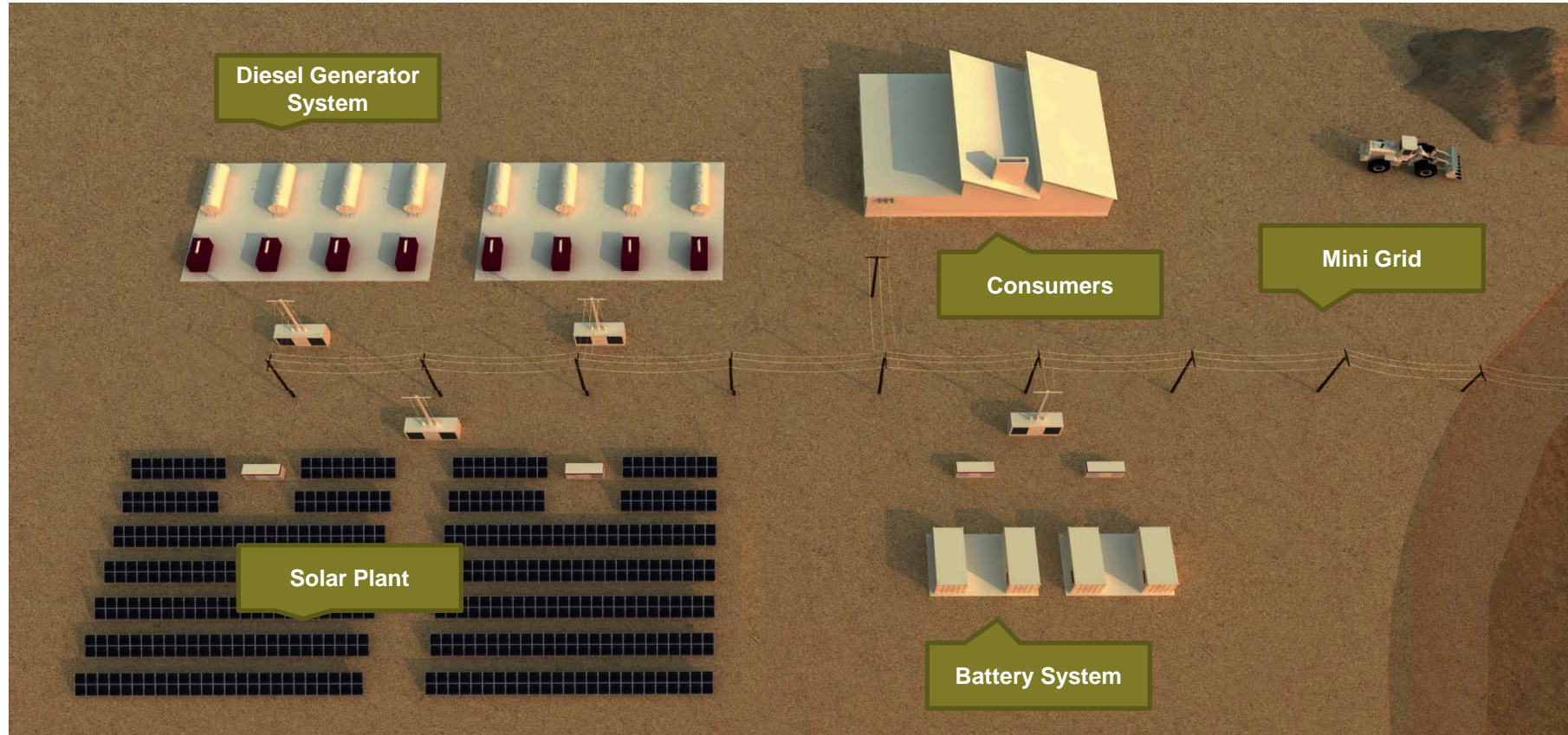


High Penetration System, Namibia



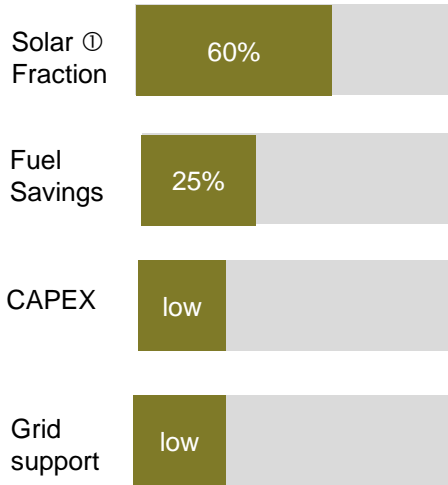
Low Penetration System, Kenya

Solar Fuel Saver Applications



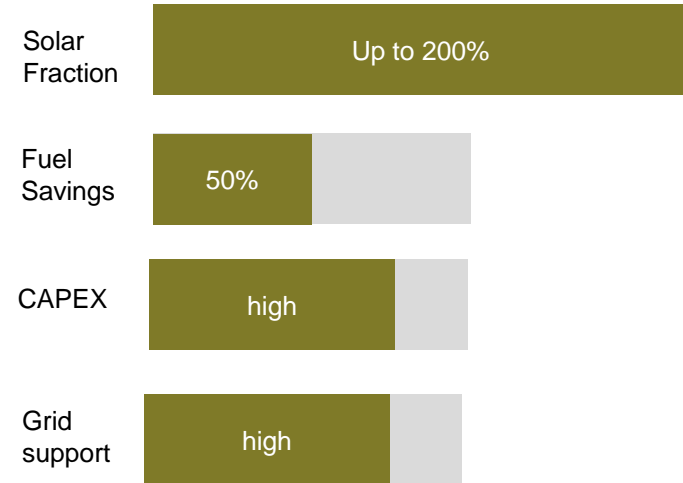
Low and High RE Penetration

Low Penetration Applications



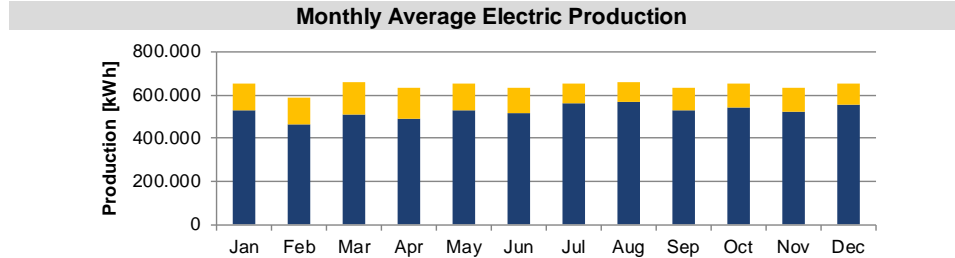
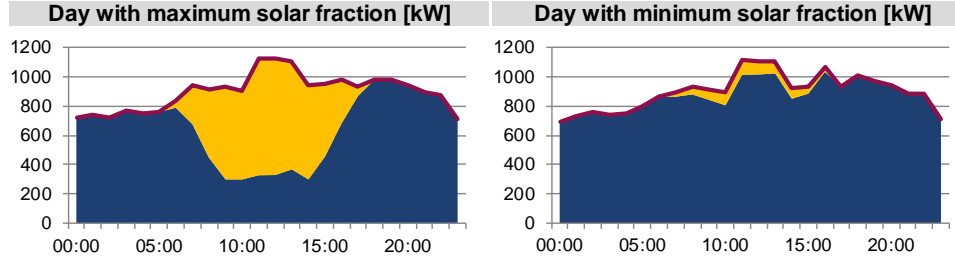
- Generator leading system
- Simple control mechanism
- No BESS necessary
- Brownfield

High Penetration Applications



- Inverter and generator leading system
- Complex control mechanism
- BESS necessary
- Diesel off-mode

Technical and Economical Analysis

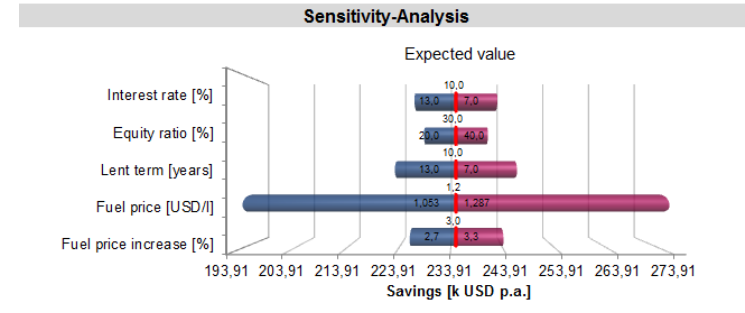
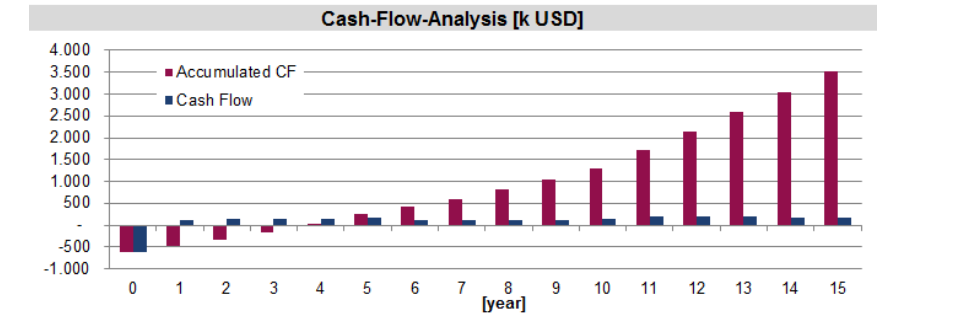


Design Optimization

- Solar irradiation and power production
- Ramping optimization
- Fuel Savings
- Battery Load pattern

Financial Evaluation

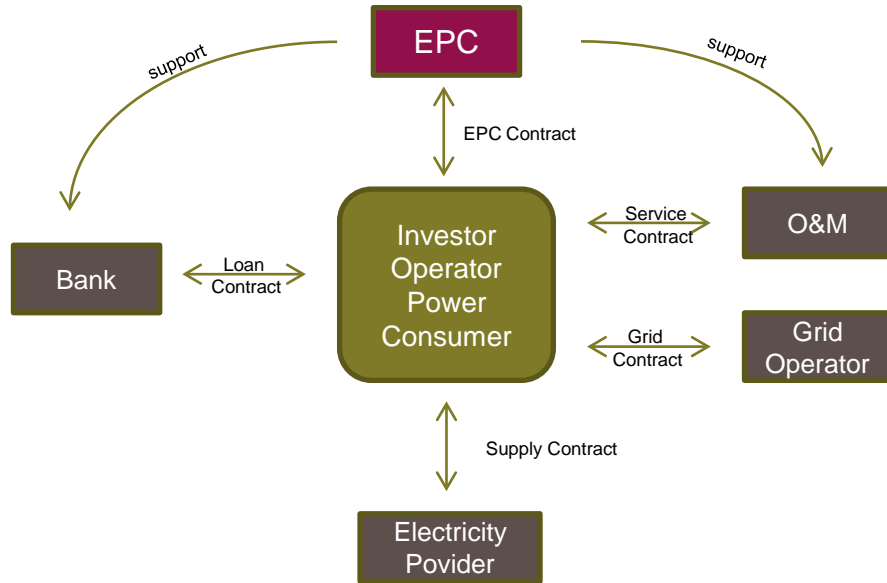
- EPC Costs
- LCOE Calculations
- Cash flow analysis
- Sensitivity analysis



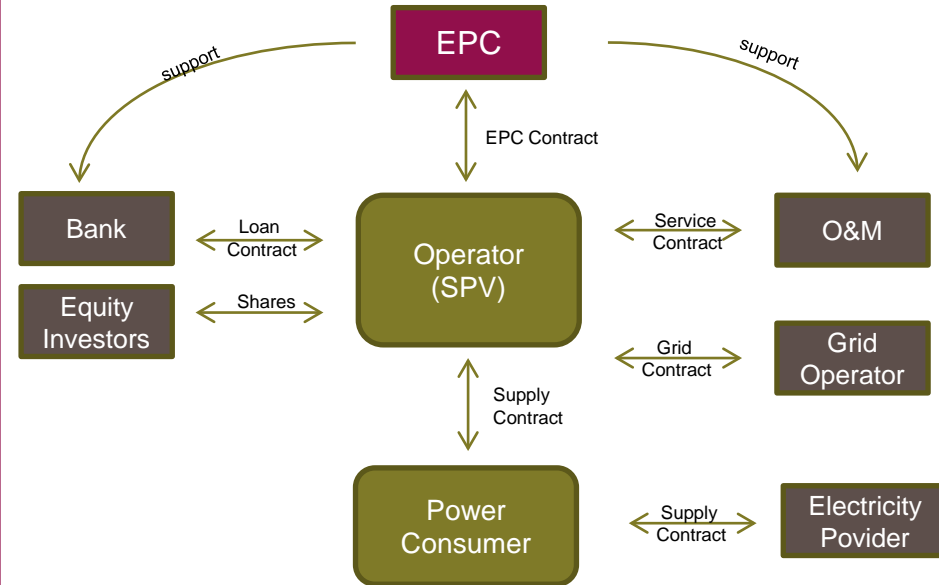
Business Concepts



Own Consumption



IPP



Next step: Pre-Feasibility Study



Juwi offers a customized technical layout and economical analysis:

- Send us your requirements by using our standard questionnaires (www.juwi.com/solarfuelsaver)
- We send you a first technical and economical budget proposal

We can offer support in project development

Contact possibilities: Off-grid@juwi.com



Control Room, monitoring >2 GWp RE projects

Thank You!



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