flexenclosure

eSite

Deployment Case Study

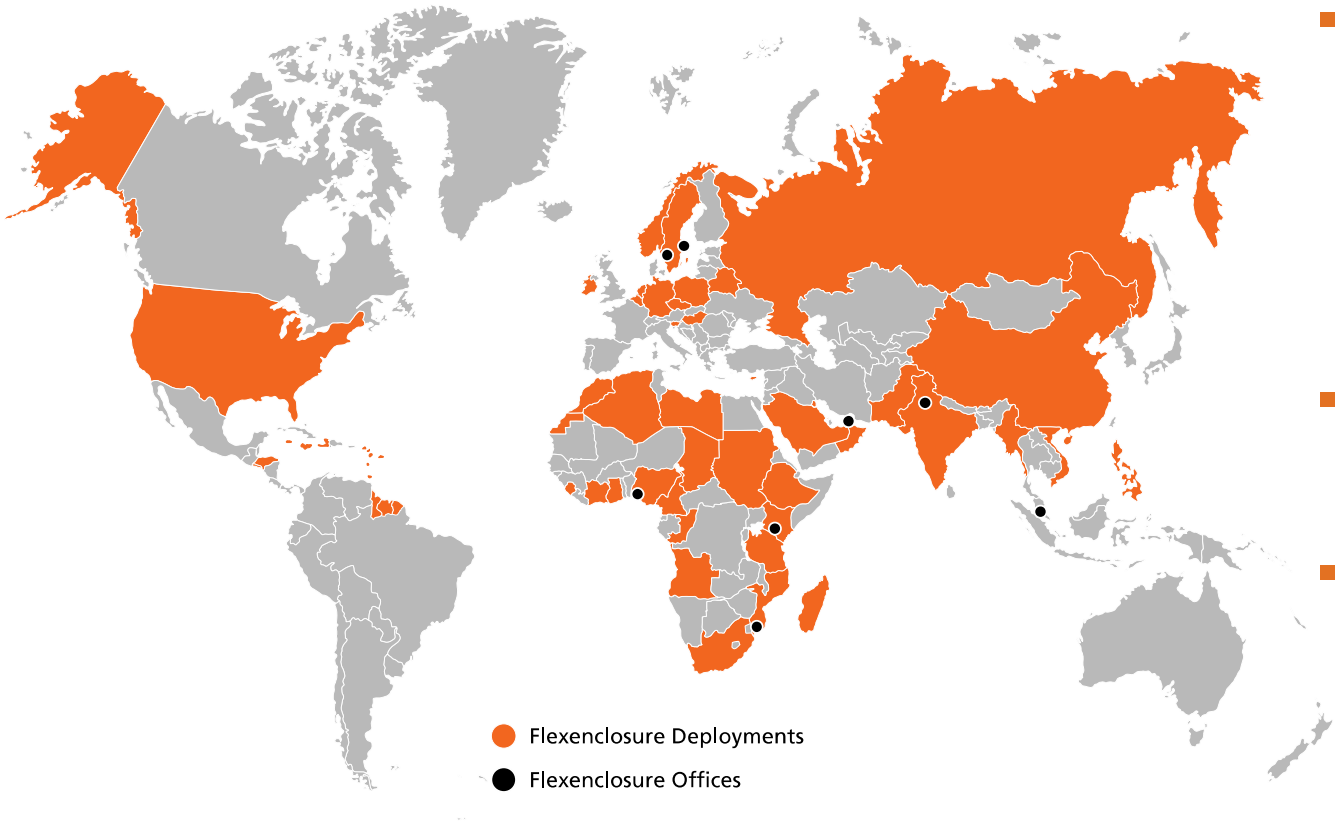








Flexenclosure



- 25 years in the rural telecom industry, with 9,000 installations in more than 50 countries worldwide
- Peace of mind in extreme environments
- Recipient of multiple industry awards

DatacenterDynamics AWARDS EMEA 2013 FINALIST

PROUDLY PART OF SUSTAINIA 100

GLOBAL MOBILE AWARDS 2012 WINNER

INTERNATIONAL GREEN AWARDS WINNER 2011

GLOBAL MOBILE AWARDS 2011 WINNER

Winner 2010 AfricaCom Awards

Mobile Innovation Global Award 2008 CATEGORY WINNER

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eSite

Hybrid power systems for off/bad-grid cell sites cutting diesel costs by up to 90%





eCentre

Custom-designed prefabricated datacentre **buildings**

that are fast to deploy, energy efficient and easy to expand



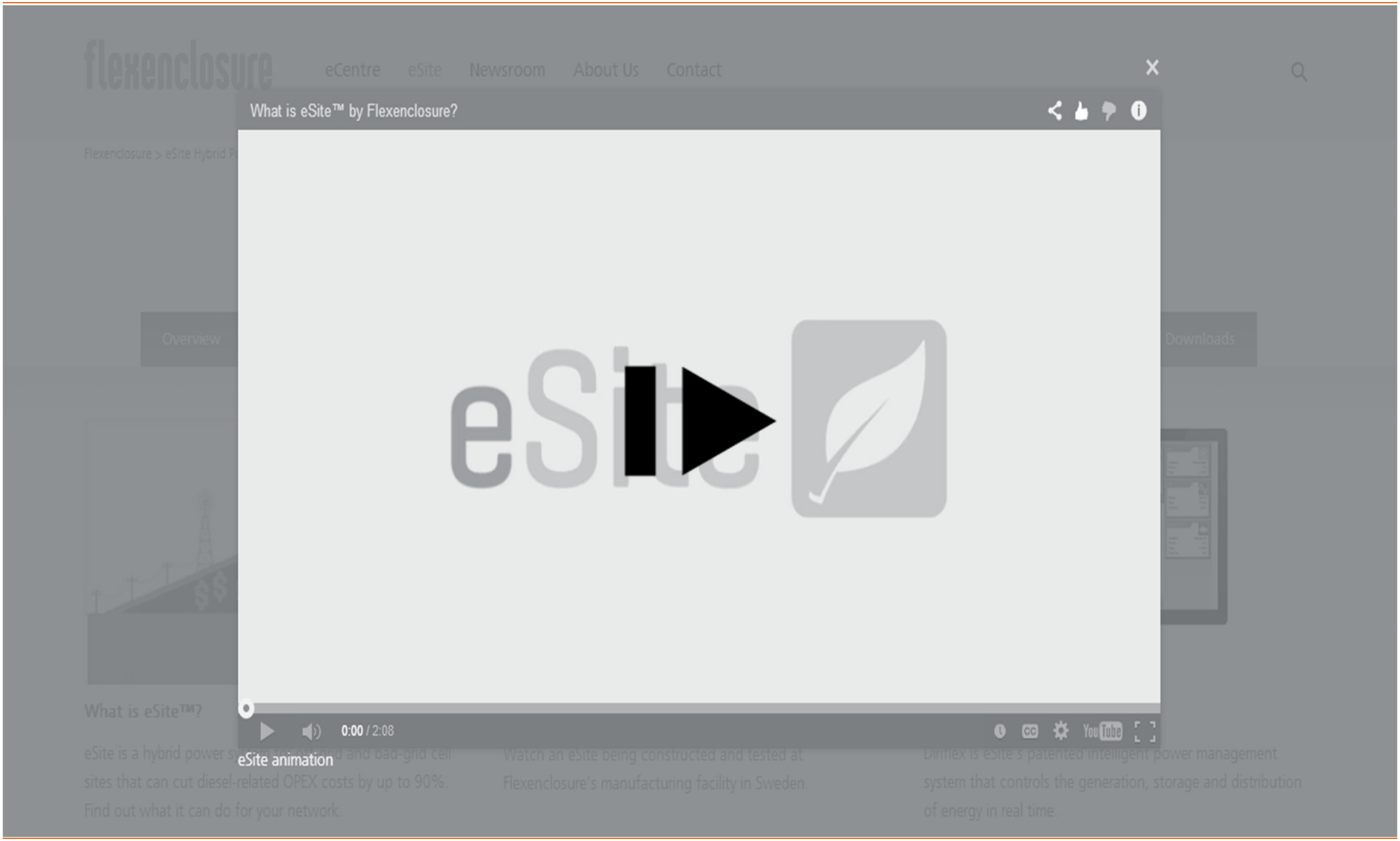
Prefabricated, fully equipped



Deployed as whole buildings



Open floor space, no walls


flexenclosure
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eSite
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Flexenclosure > eSite Hybrid P
Overview
Downloads
What is eSite™ by Flexenclosure?
0:00 / 2:08
eSite animation
What is eSite™?
eSite is a hybrid power s
sites that can cut diesel-related OPEX costs by up to 90%.
Find out what it can do for your network.
Watch an eSite being constructed and tested at
Flexenclosure's manufacturing facility in Sweden.
system that controls the generation, storage and distribution
of energy in real time.

Deployments

eSite





Bharti Infratel Limited

etisalat

orange™

telenor

MTN

inwi™

helios towers

zain

vodacom

flexenclosure

Botswana

eSite



Swaziland

eSite



Sweden

eSite



Morocco

eSite



Actual measured savings of eSite deployments

Operator	Sources	Average load	Genset run-hours	Genset run-hour reduction
Airtel Nigeria	Solar	1.0 kW	2.4 h/day	91%
Airtel Tanzania	Solar	0.9 kW	2.0 h/day	92%
Bharti Infratel India	Solar	1.5 kW	3.3 h/day	86%
Etisalat Nigeria	Solar & Wind	1.6 kW	1.5 h/day	94%
IHS Nigeria	Grid	1.8 kW	0.5 h/day	95%
HTN Nigeria	Solar	2.4 kW	4.9 h/day	80%
MTN Nigeria	Solar	1.4 kW	4.5 h/day	81%
MTN South Sudan	Solar	1.4 kW	2.2 h/day	91%
MTN Swaziland	Grid	1.6 kW	0.9 h/day	96%
Telenor Pakistan	Solar	0.9 kW	2.3 h/day	90%
Telenor Pakistan	Grid	1.2 kW	0.6h/day	98%
Vodacom Tanzania	Solar	1.6 kW	2.6 h/day	89%
Zain Sudan	Solar & Wind	1.3 kW	0.5 h/day	95%

Savings example (summary)

Generated energy (kWh)	67 days	Average 1 day
Genset	1,782	26.7
Solar	821	12.3
Total	2,603	39.0

Consumed energy (kWh)	67 days	Average 1 day
Site DC load	2,364	35.4
Rectifier loss	61	0.9
Battery & system loss	178	2.7
Total	2,603	39.0

Genset runhour & diesel analysis	67 days	Average 1 day
eSite genset runhours	208 h	3.12 h
Runhours prior to upgrade	1600 h	24 h
eSite genset runhour saving	87.0%	
eSite diesel consumption (2.57 l/h)	535 liters	8 liters
Diesel consumption prior to upgrade (2.0 l/h)	3202 liters	48 liters
eSite diesel saving	83.3%	

Savings example (detail)

Total generated energy is 2,603 kWh and consumed energy is 2,364 kWh (= site DC load)



Total 821 kWh from solar

Total 1,782 kWh from genset in 208 runhours

Site runtime 1,600h = 67 days (no downtime)

Example week: 10 genset runs * 1.8 h/each = 18 genset hours
This is a weekly 89.3% saving in genset runhours

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Challenges

MONEY

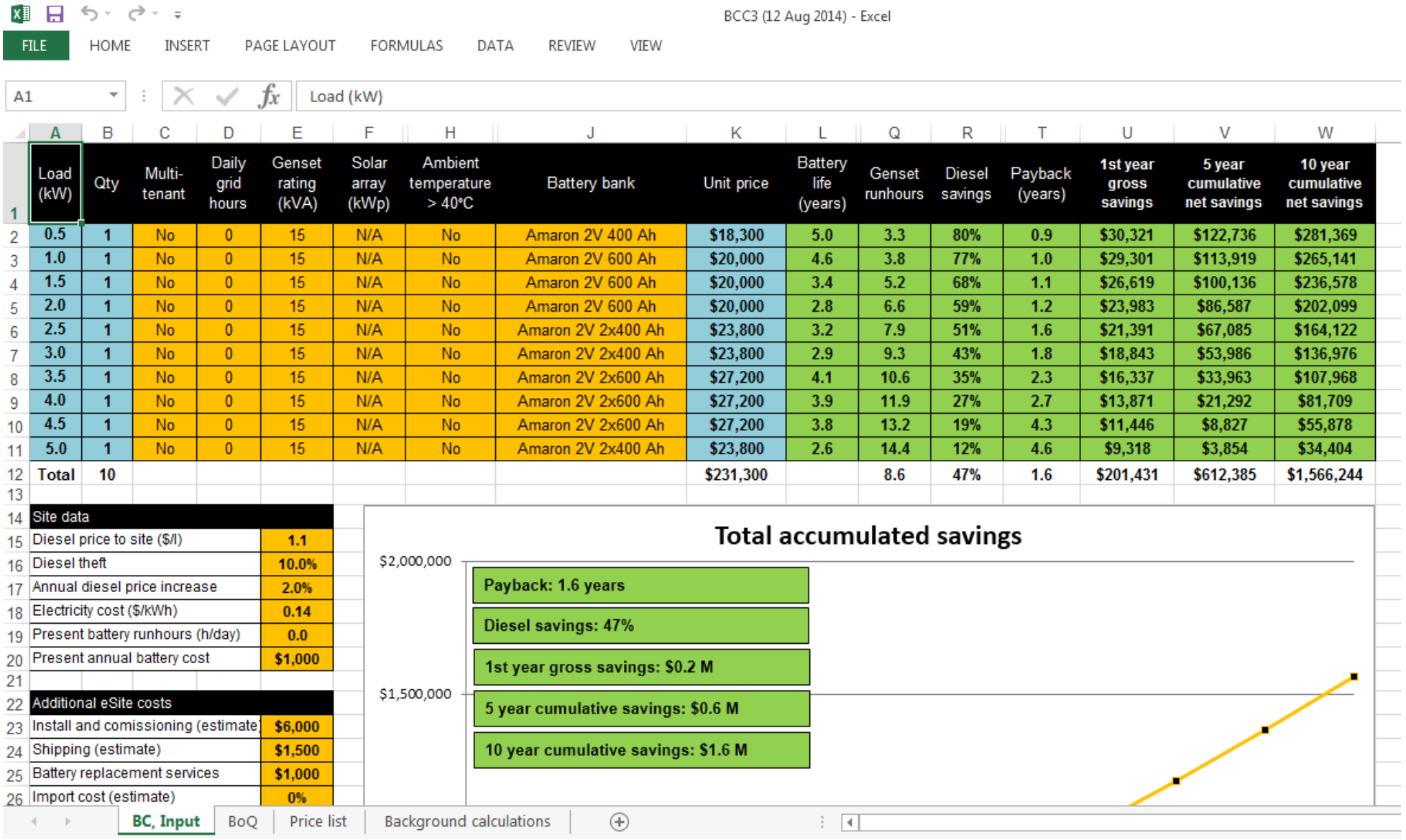
- How to motivate to invest in future savings?
- How to secure funding?

OPERATIONAL

- How to ensure successful implementation?
- How to set up support?
- How to ensure promised performance is achieved?

DEADLINES

Investing in future savings?



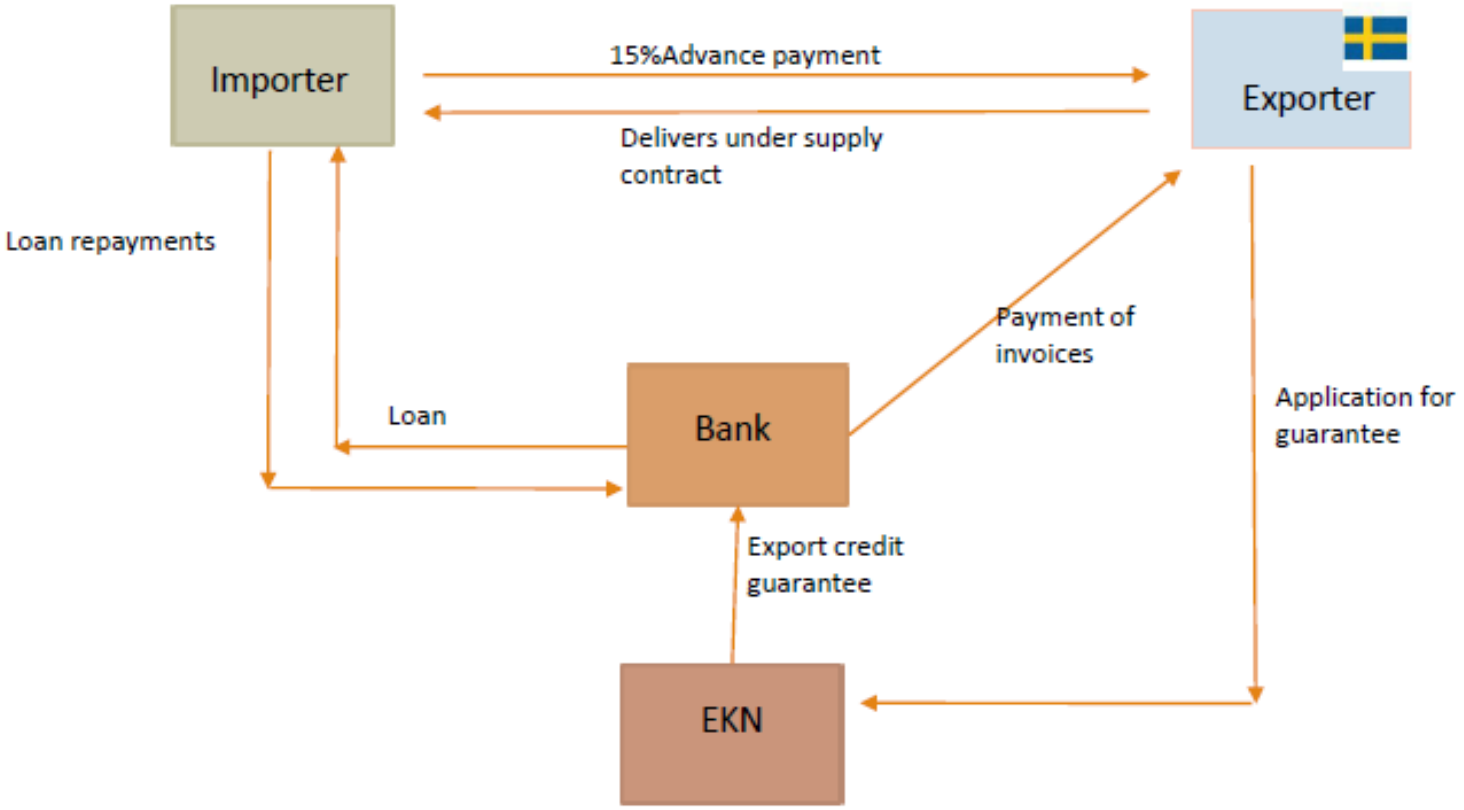
Load (kW)	Qty	Multi-tenant	Daily grid hours	Genset rating (kVA)	Solar array (kWp)	Ambient temperature > 40°C	Battery bank	Unit price	Battery life (years)	Genset runhours	Diesel savings	Payback (years)	1st year gross savings	5 year cumulative net savings	10 year cumulative net savings
0.5	1	No	0	15	N/A	No	Amaron 2V 400 Ah	$18,300	5.0	3.3	80%	0.9	$30,321	$122,736	$281,369
1.0	1	No	0	15	N/A	No	Amaron 2V 600 Ah	$20,000	4.6	3.8	77%	1.0	$29,301	$113,919	$265,141
1.5	1	No	0	15	N/A	No	Amaron 2V 600 Ah	$20,000	3.4	5.2	68%	1.1	$26,619	$100,136	$236,578
2.0	1	No	0	15	N/A	No	Amaron 2V 600 Ah	$20,000	2.8	6.6	59%	1.2	$23,983	$86,587	$202,099
2.5	1	No	0	15	N/A	No	Amaron 2V 2x400 Ah	$23,800	3.2	7.9	51%	1.6	$21,391	$67,085	$164,122
3.0	1	No	0	15	N/A	No	Amaron 2V 2x400 Ah	$23,800	2.9	9.3	43%	1.8	$18,843	$53,986	$136,976
3.5	1	No	0	15	N/A	No	Amaron 2V 2x600 Ah	$27,200	4.1	10.6	35%	2.3	$16,337	$33,963	$107,968
4.0	1	No	0	15	N/A	No	Amaron 2V 2x600 Ah	$27,200	3.9	11.9	27%	2.7	$13,871	$21,292	$81,709
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5.0	1	No	0	15	N/A	No	Amaron 2V 2x400 Ah	$23,800	2.6	14.4	12%	4.6	$9,318	$3,854	$34,404
Total	10							$231,300		8.6	47%	1.6	$201,431	$612,385	$1,566,244

Site data	
Diesel price to site ($/l)	1.1
Diesel theft	10.0%
Annual diesel price increase	2.0%
Electricity cost ($/kWh)	0.14
Present battery runhours (h/day)	0.0
Present annual battery cost	$1,000

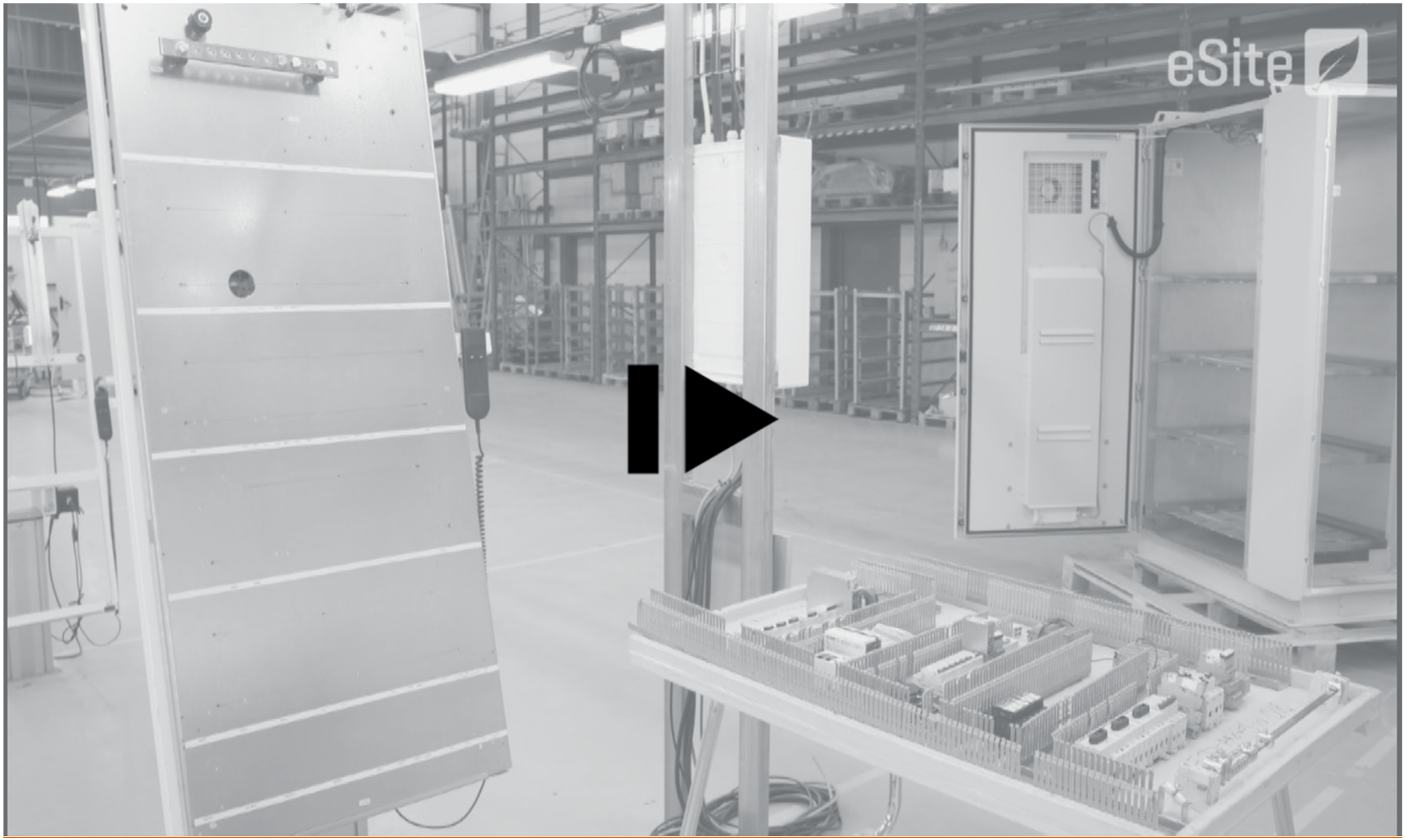
Additional eSite costs	
Install and comissioning (estimate)	$6,000
Shipping (estimate)	$1,500
Battery replacement services	$1,000
Import cost (estimate)	0%

Secure funding?

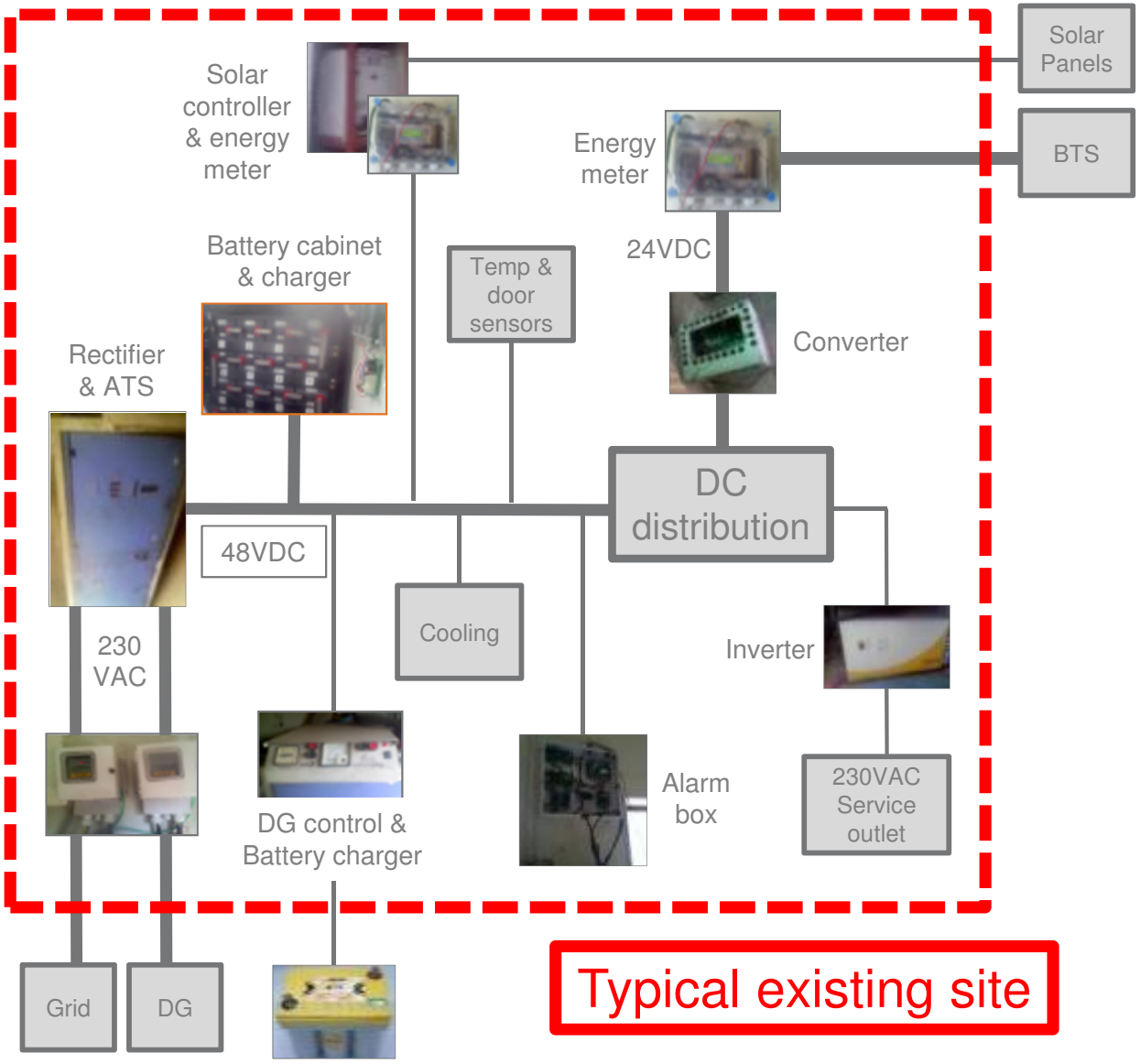
EKN guaranteed financing: flow diagram



Operational



Site modernisation - simplicity in the field



Typical existing site



Replaced by eSite

Site modernisation - simplicity in the field

1 HOUR IN FACTORY

=

4 HOURS ON SITE

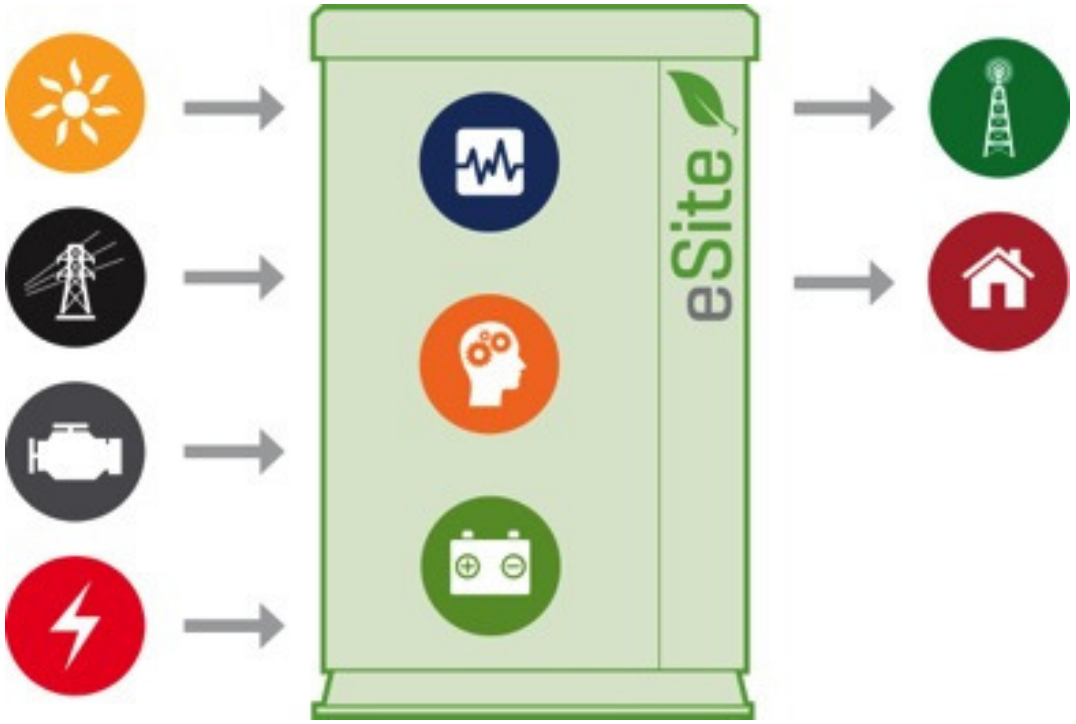


Replaced by eSite

What about monitoring?

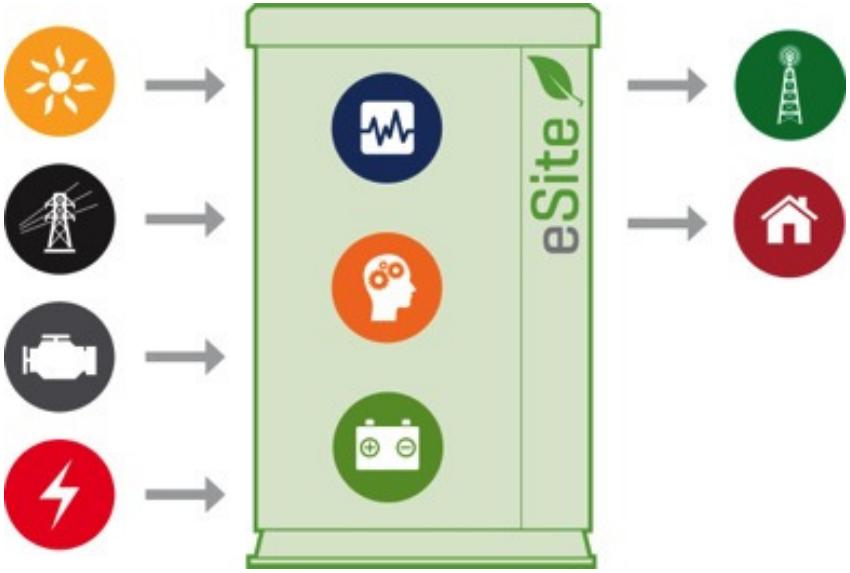
Integrated Systems

- Energy manager
- Grid manager
- Energy monitoring tool
- Fuel monitoring tool



Diriflex

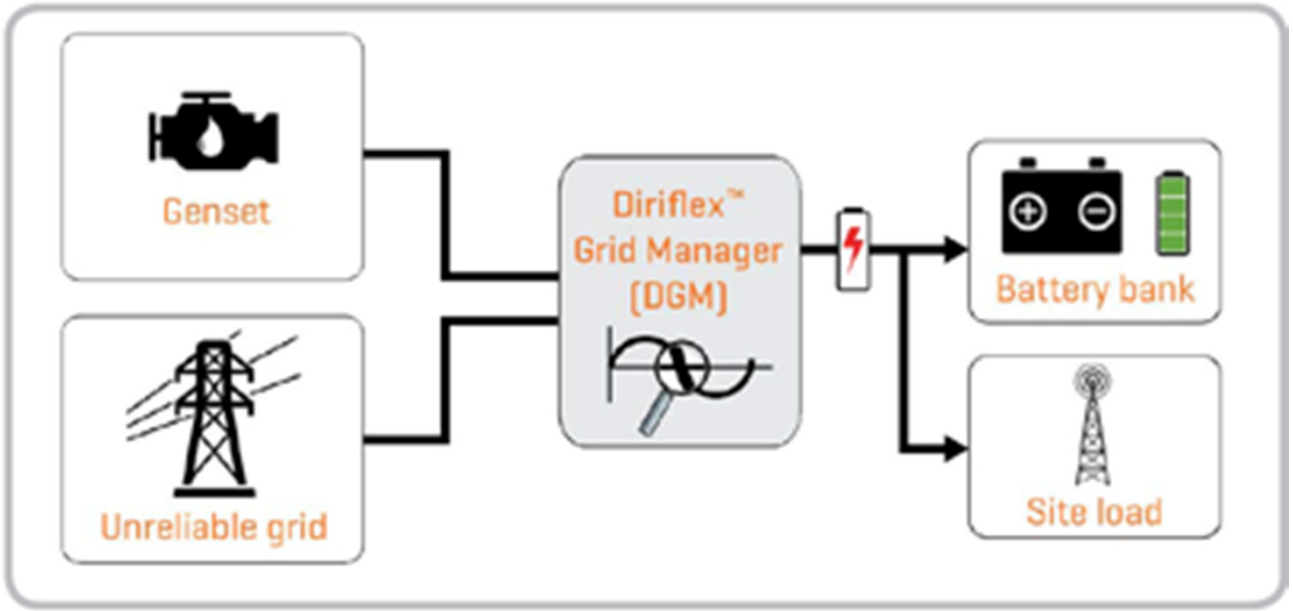
- Patented Diriflex™ control system - the brain of eSite
- Optimises the use of batteries and renewable energy sources (if available) to lower diesel consumption, while prolonging the lifespan of the batteries and other components
- One control system for all energy sources enables optimal decisions regarding energy efficiency
- Database with +200 parameters, local data storage and computing for communication efficiency





Diriflex Grid Manager (DGM)

- Maximizes the usability of available grid, even if one or two phases lost
- Wide input voltage span (80 to 300 VAC, 45 to 65 Hz)
- Prioritizes renewable sources and grid over genset
- Supports 3-phase/1-phase grid or genset in any combination
- Does not start genset immediately if grid is lost, monitors SOC and determines when necessary to start
- Integrated in eSite cabinet



eManager

- eManager™ is an energy monitoring and management system, providing a one-stop interface for:
  - Energy OPEX & KPI follow-up
  - Detailed power analysis
  - Diesel and site service logistics
  - Site surveillance and alarms
  - Remote trouble-shooting
  - Asset management
  - Optimised power usage system-wide
  - Energy data warehouse
- eManager is fully integrated into eSite



eSite fuel monitoring

- Submersible pressure sensor
- Fully integrated with eManager



- Features
  - Fuel tank level (Litres)
  - Filled volume (Litres)
  - Stolen volume (Litres)
  - Fuel consumption (Litres)
  - Total consumption (Litres)
  - Time left to empty tank (Days)
- Alarms
  - Low fuel
  - Very low fuel
  - Lid open
  - Theft
  - Fill up
  - Sensor removed from tank
  - Sensor error

Support?

Remote Support and Software Maintenance (RSSM)

- Hotline support:
- Remote system expert support
- Software updates

Network Audits

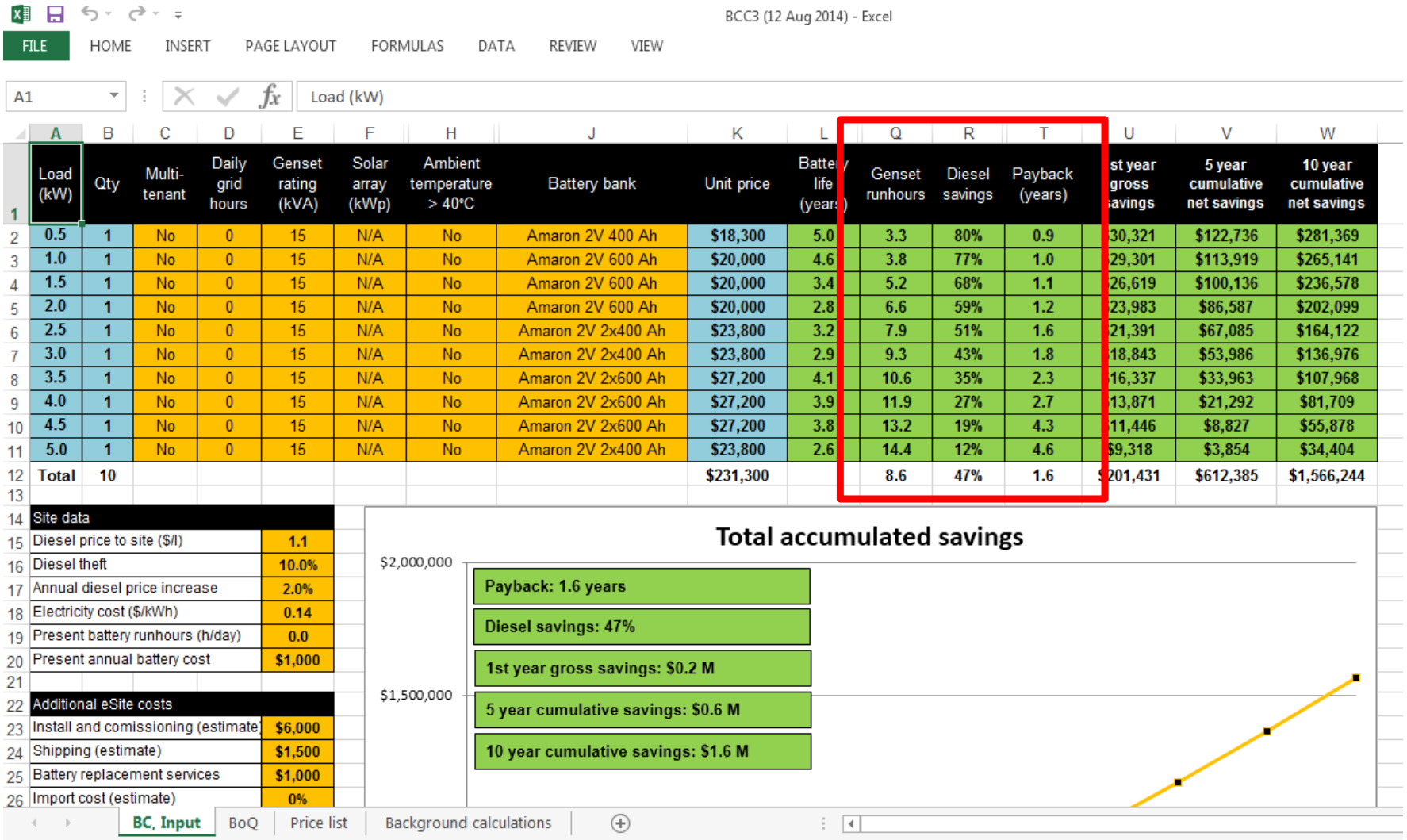
- Network Audits are performed annually whereby Flexenclosure provides a full report on system performance and corrective or improvement actions to be taken

Performance Optimisation Service (POS)

- Performance Optimisation Service is a service provided by our local support office in country to enable the user maintain the highest level of eSite performance

Performance guarantees?

KPIs



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BC, Input | BoQ | Price list | Background calculations

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