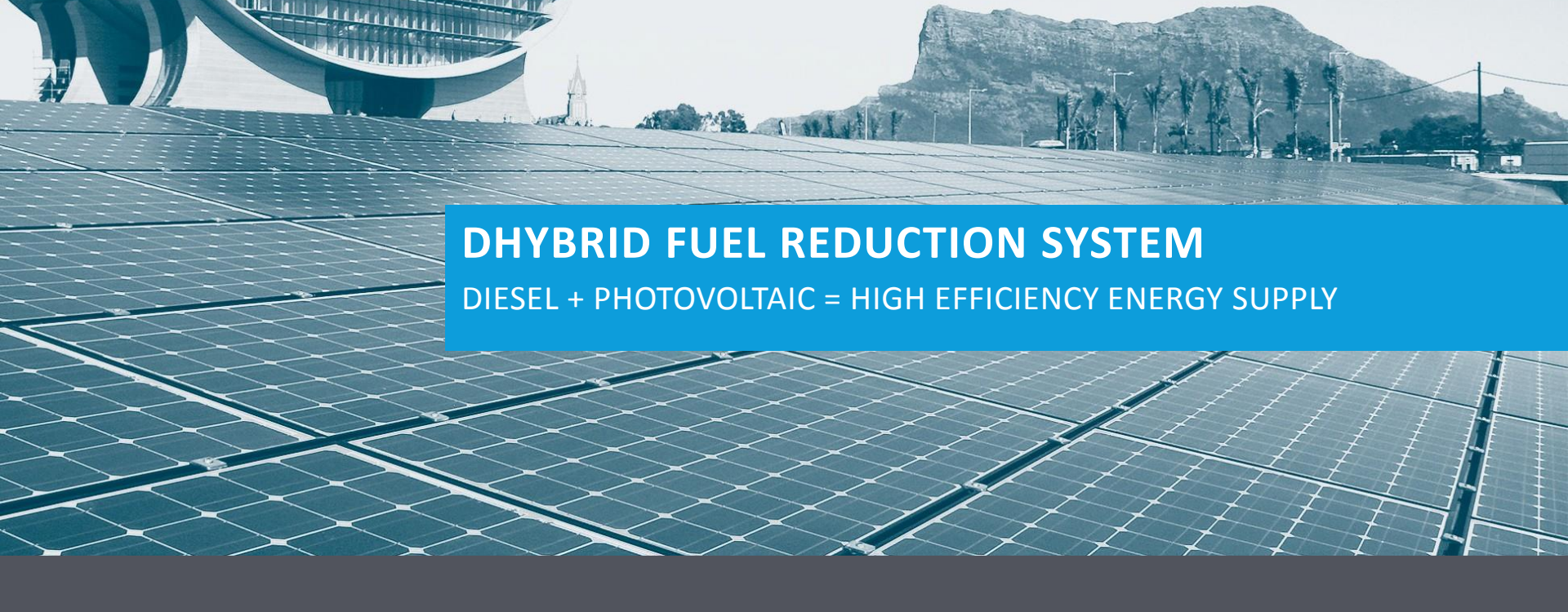


DHYBRID FUEL REDUCTION SYSTEM

DIESEL + PHOTOVOLTAIC = HIGH EFFICIENCY ENERGY SUPPLY



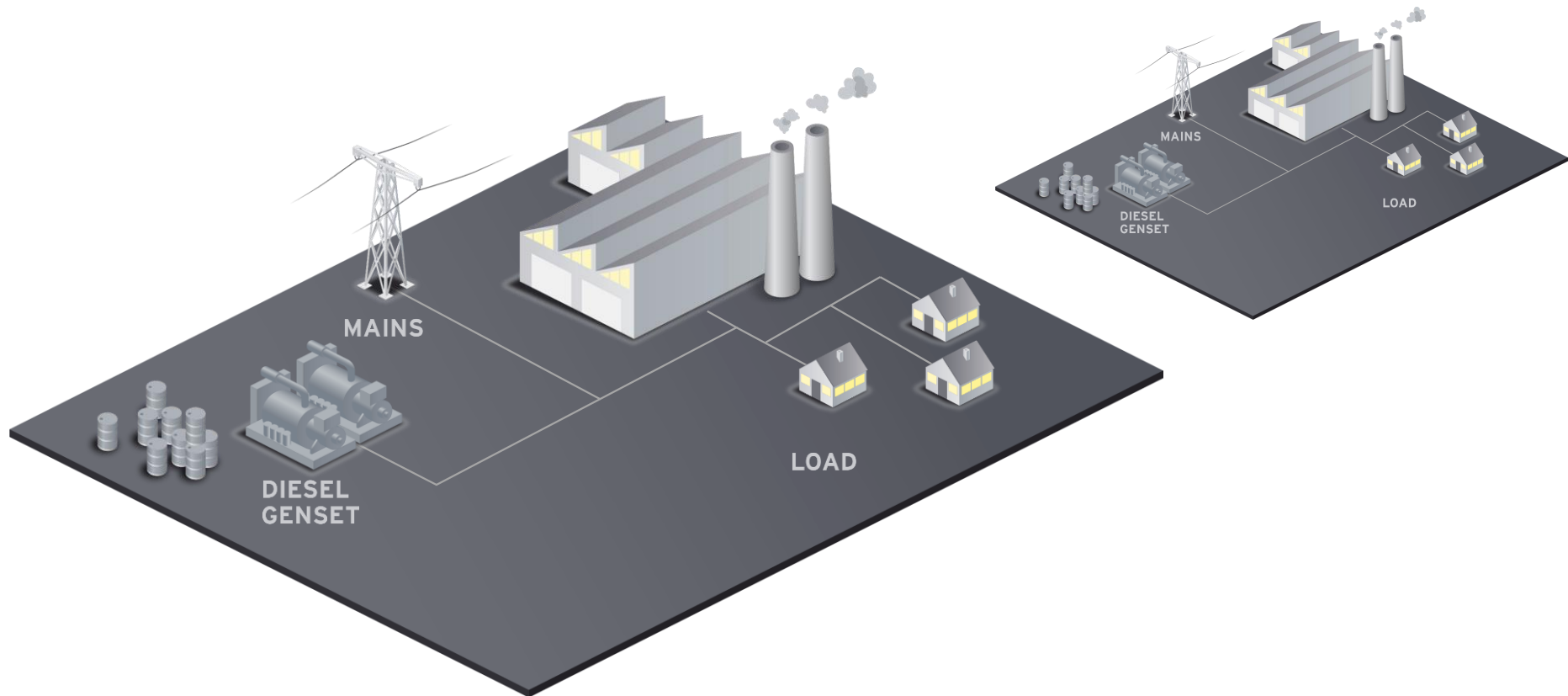
AGENDA

1. Conventional Power Generation
2. DHYBRID Fuel Reduction System
3. Case Study
4. Reference Installations
5. Summary

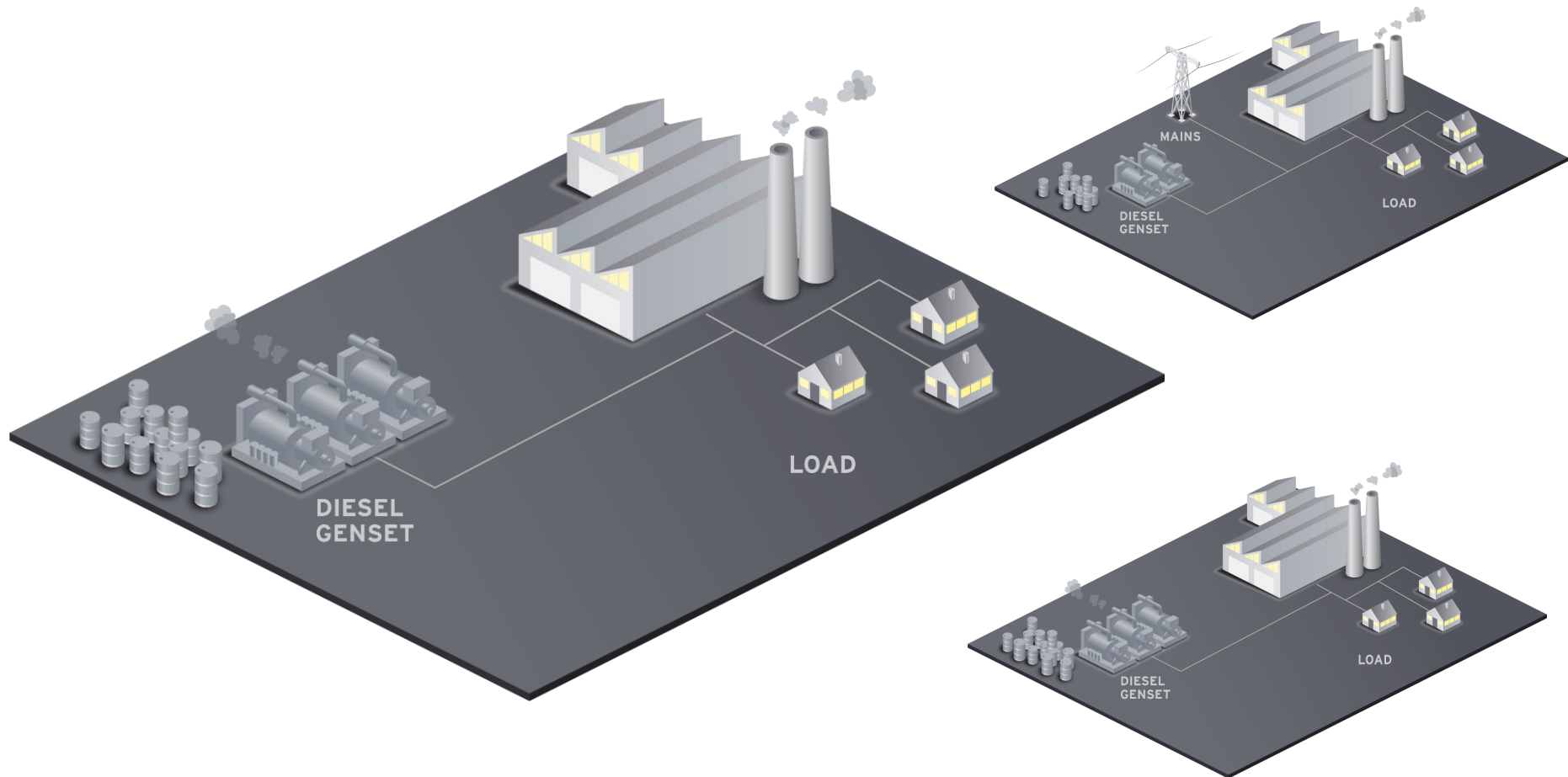
PART I

CONVENTIONAL POWER GENERATION

GRID- DIESEL POWER GENERATION SYSTEMS

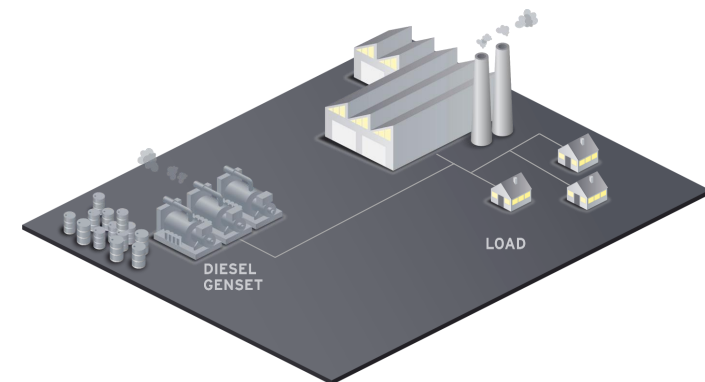
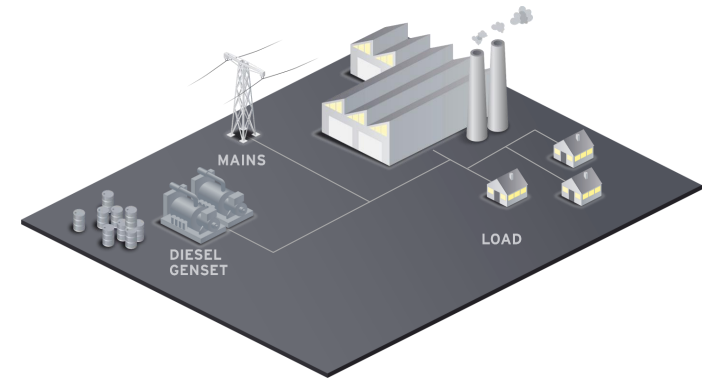


DIESEL POWER GENERATION SYSTEMS



GRID- DIESEL POWER GENERATION SYSTEMS

- ✓ High and increasing costs for diesel fuel
- ✓ High costs of electricity
- ✓ Delivery and import dependence
- ✓ High maintenance costs
- ✓ Ecological impact



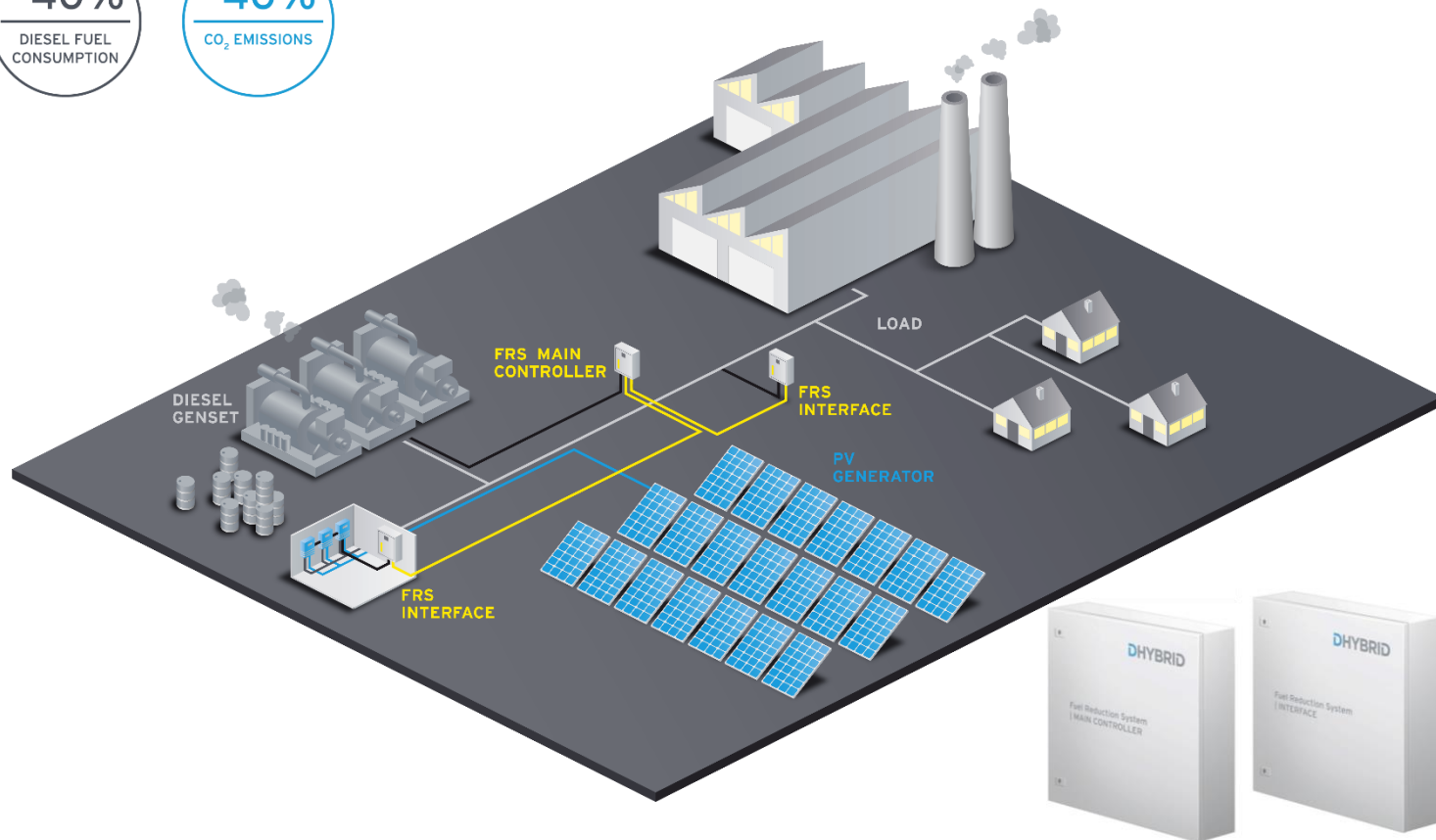
PART II

DHYBRID FUEL REDUCTION SYSTEM

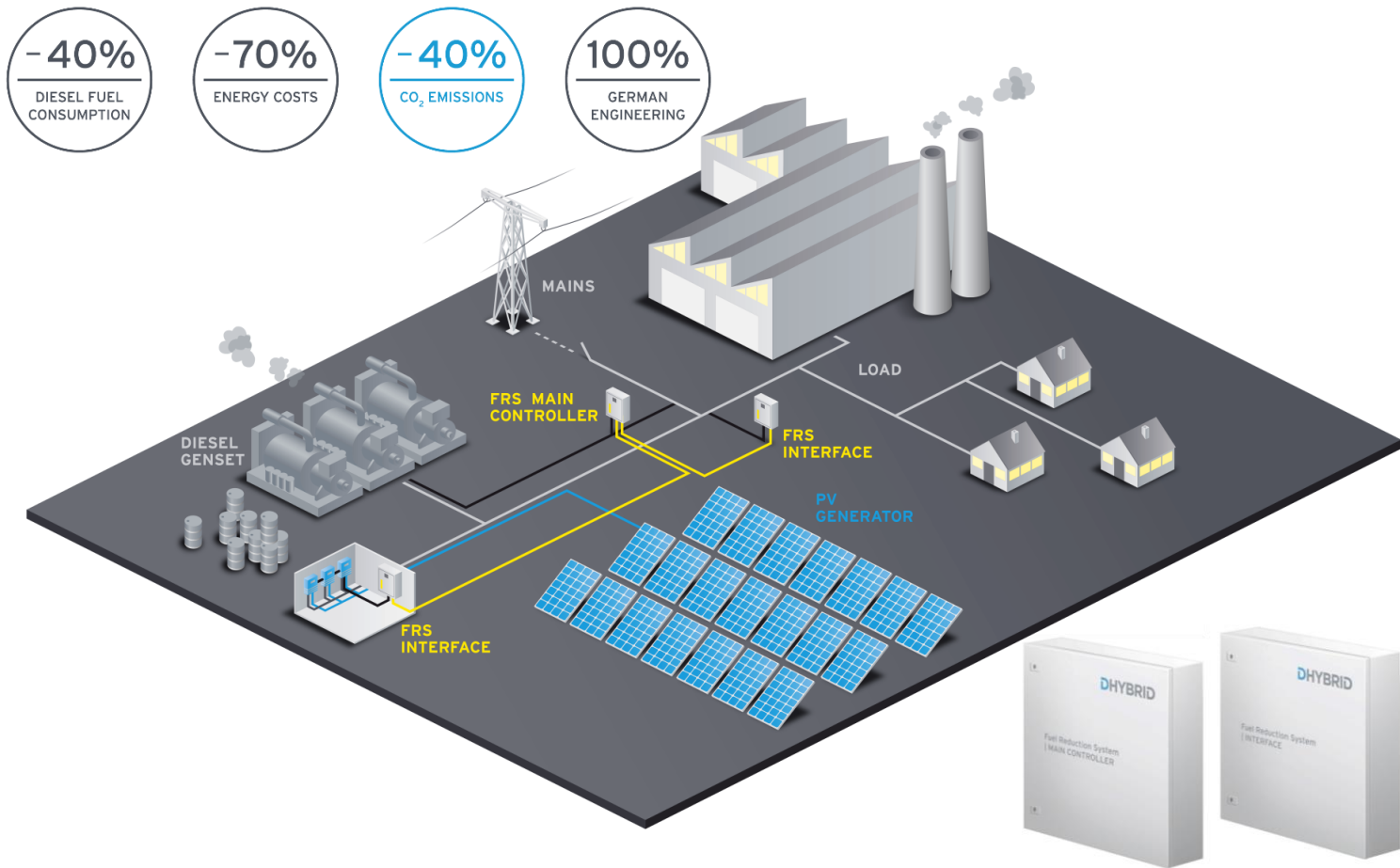
DHYBRID FUEL REDUCTION SYSTEM | GENERATOR OPERATION

-40%
DIESEL FUEL
CONSUMPTION

-40%
CO₂ EMISSIONS



DHYBRID FUEL REDUCTION SYSTEM | GENERATOR + GRID OPERATION



PART III

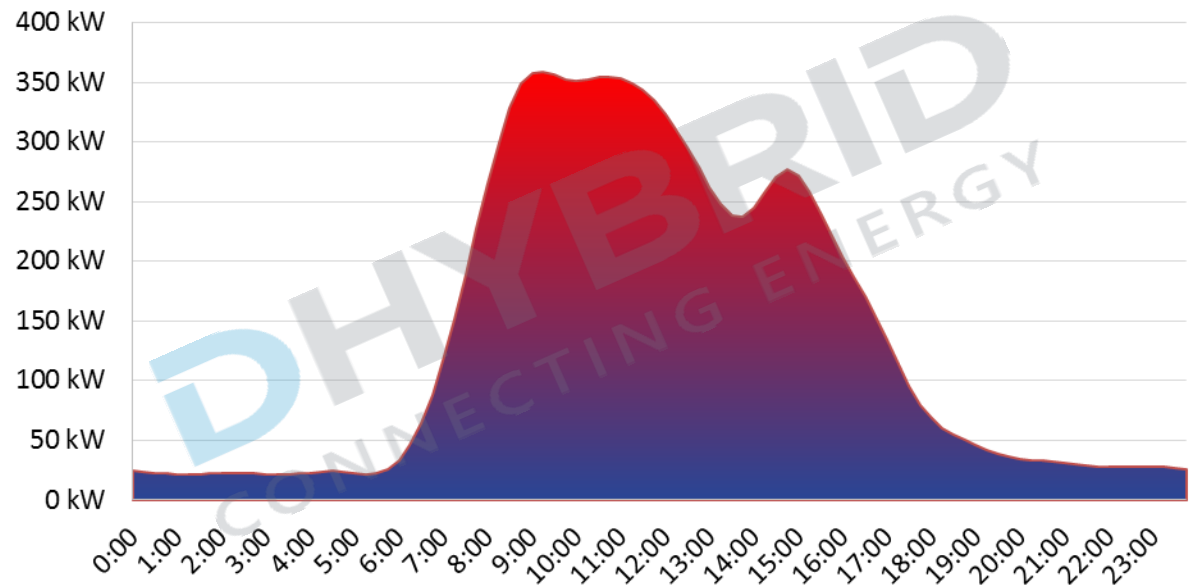
CASE STUDY

CASE STUDY – LOAD PROFILE

DAILY LOAD PROFILE

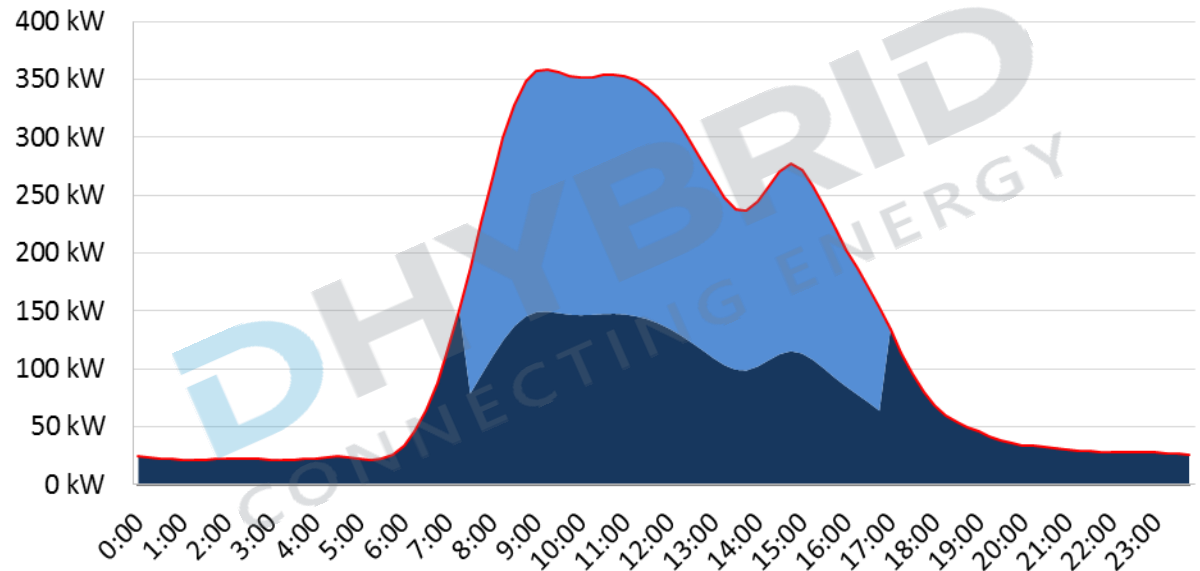
ENERGY
CONSUMPTION:

1,200,000 kWh p.a.



CASE STUDY – GENERATOR OPERATION

DIESEL CAPACITY:
GENSET 1: 300 KVA
GENSET 2: 350 KVA
DIESEL COSTS:
0.8 USD / LITER



CASE STUDY – DHYBRID FUEL REDUCTION SYSTEM

DHYBRID FUEL REDUCTION SYSTEM

PV PLANT

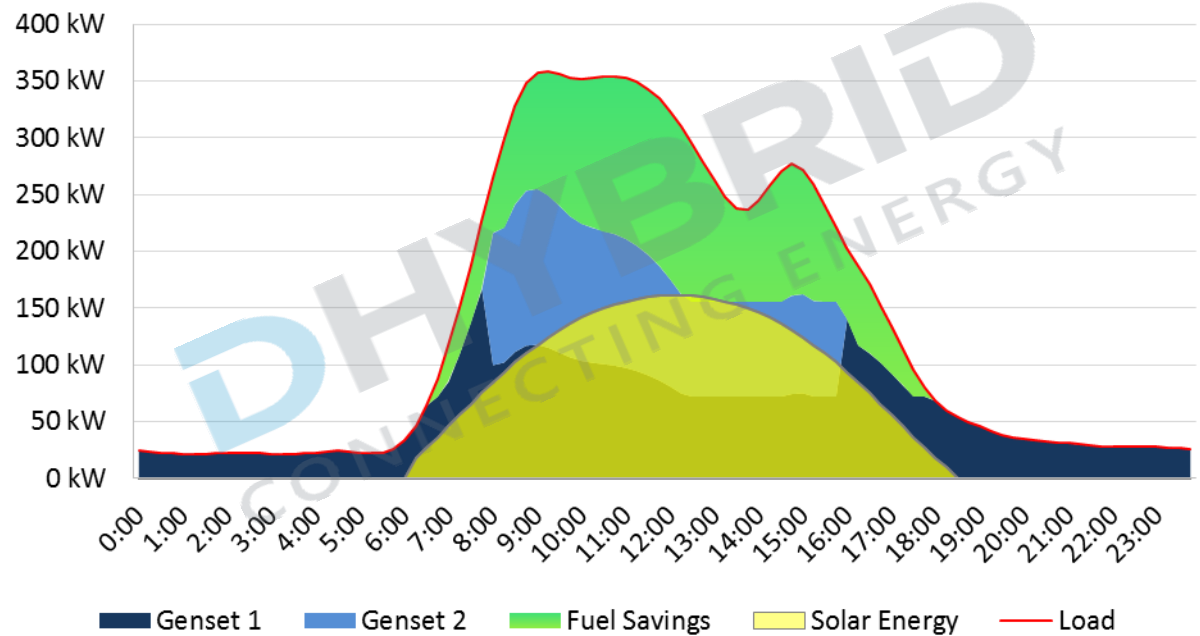
280 kWp

SPECIFIC ENERGY YIELD:

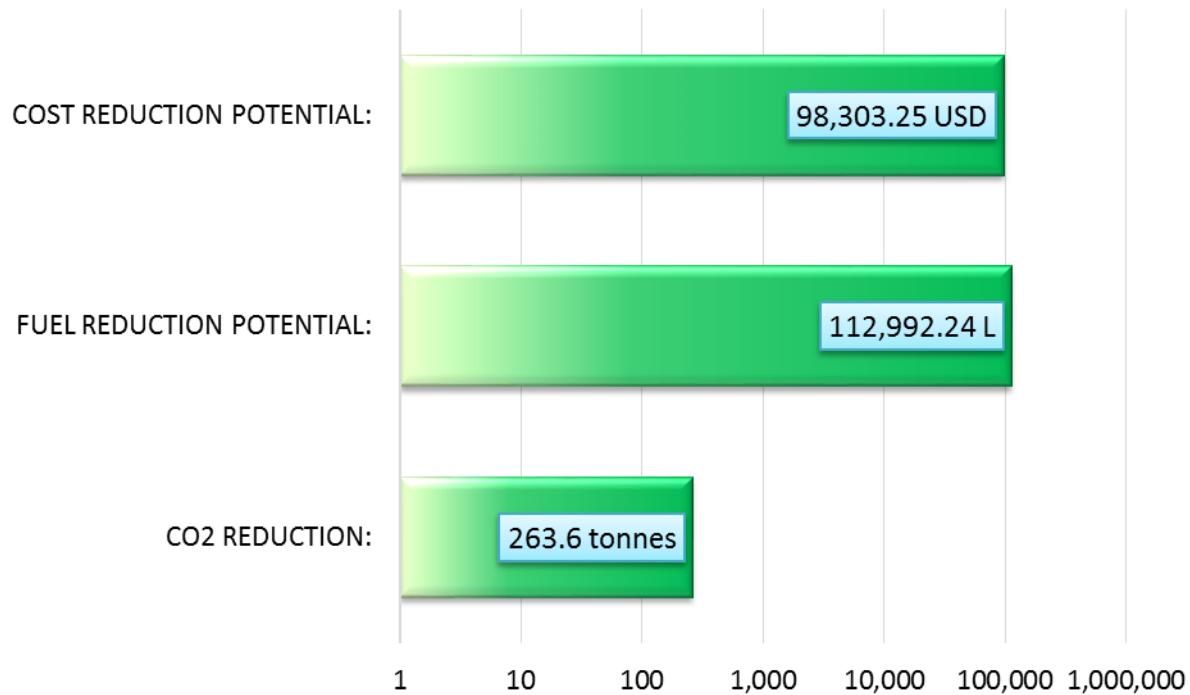
1480 kWh/kWp

PV UTILIZATION RATE:

> 90%

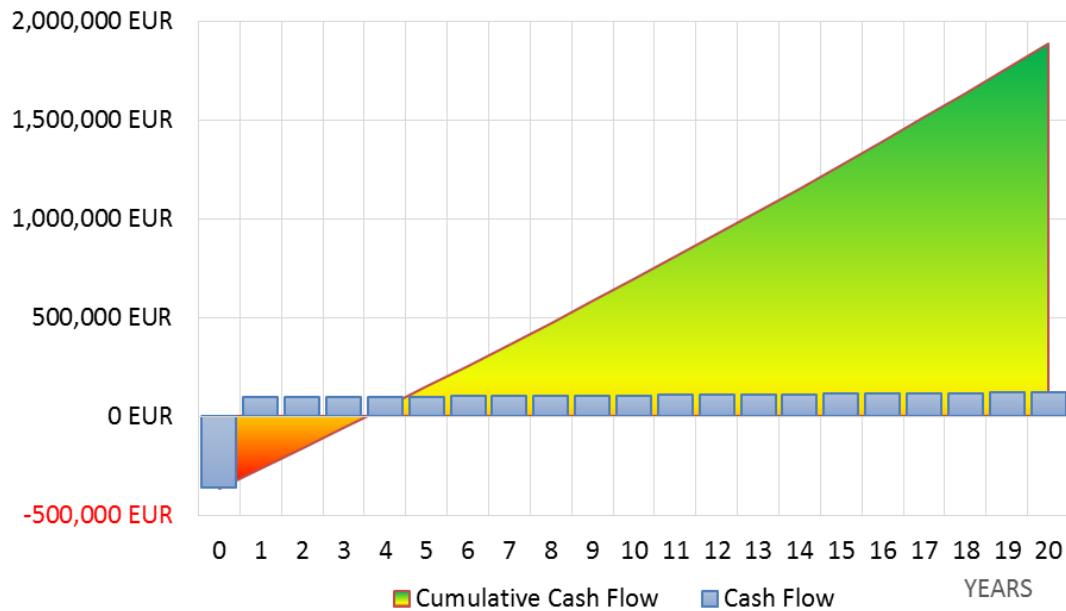


CASE STUDY - ANNUAL REDUCTION



~ 310 LITER PER DAY | DIESEL FUEL REDUCTION

CASE STUDY – INVESTMENT & ECONOMIC DHYBRID ANALYSIS



2-4 YEARS | AVERAGE ROI

CASE STUDY – BAD ENGINEERING SCENARIO

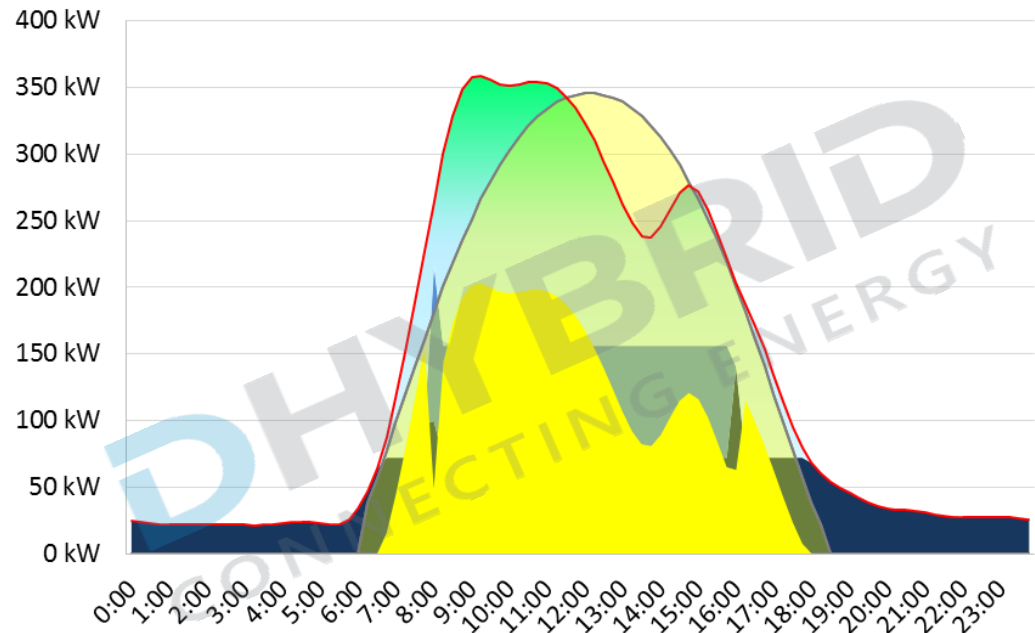
“BAD ENGINEERING”
SCENARIO

PV PLANT

600 kWp

PV UTILIZATION RATE:

< 56%



ROI > 6 YEARS

DHYBRID ENGINEERING & TECHNOLOGY: ROI 2-4 YEARS

PART IV

REFERENCE INSTALLATIONS | EXTRACT

HOSPITAL | HAITI

680 kVA Total Capacity

PV | Diesel

DHYBRID Fuel Reduction System

Commissioning April 2013



HOTEL | SOUTH SUDAN

350 kVA Total Capacity

PV | Diesel

DHYBRID Fuel Reduction System

Commissioning October 2013



BREWERY | NAMIBIA

7.1 MVA Total Capacity

PV | Diesel | Grid

DHYBRID Fuel Reduction System

Commissioning October 2013



SHOPPING MALL | MAURITIUS

3.2 MVA Total Capacity

PV | Diesel | Grid

DHYBRID Fuel Reduction System

Construction September 2014



ISLAND | MALDIVES

4.1 MVA Total Capacity

PV | Diesel

DHYBRID Fuel Reduction System

Construction October 2014

- ✓ Powerhouse: 43 kW (1)
- ✓ School I: 129 kWp (2)
- ✓ Hospital: 190.5 kWp (3)
- ✓ School II: 136 kWp (4)
- ✓ Mosque: 60 kWp (5)



ISLAND | MALDIVES



ISLAND | MALDIVES

PV-Diesel-Hybrid System: *Thinadhoo Island*
Location: *Thinadhoo School*

11.12.2014 12:45:16

	Current Power Output:	103.4 kW
	Daily Energy Yield:	397.3 kWh
	Total Energy Yield:	178.1 MWh
	Total CO2 Saved:	124.6 tonnes

800 LITER PER DAY | DIESEL FUEL REDUCTION



PART V

SUMMARY

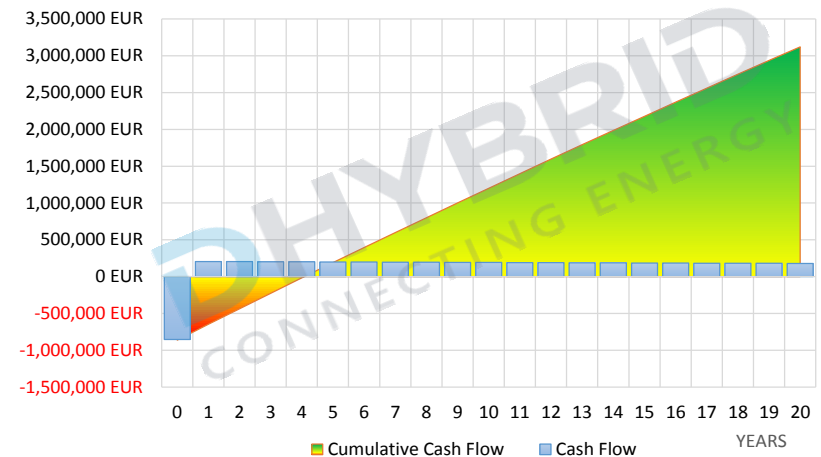
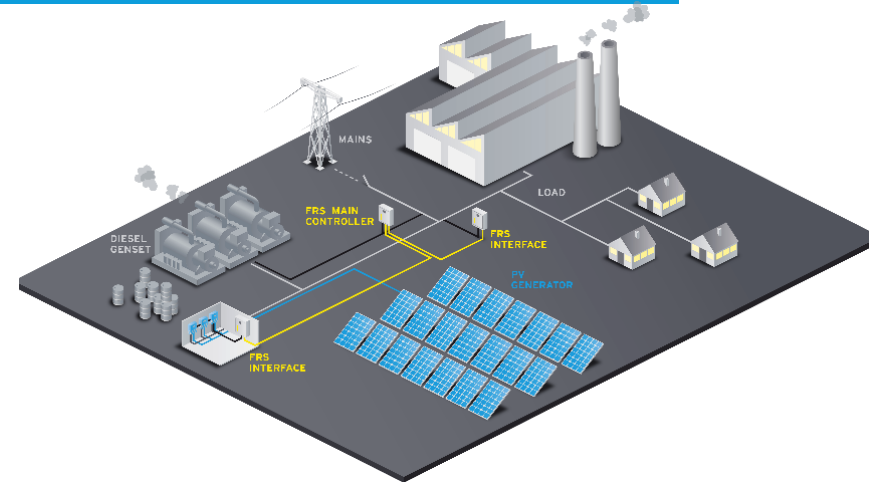
SUMMARY | TECHNICAL ASPECTS

- ✓ Suitable for any generator type
- ✓ Compatible with most inverter manufacturers
- ✓ System size modular and extendable
- ✓ High grid stability
- ✓ DHYBRID WebPortal monitoring system
- ✓ Lifetime + 25 years
- ✓ No batteries required
- ✓ Future integration of energy storage systems possible



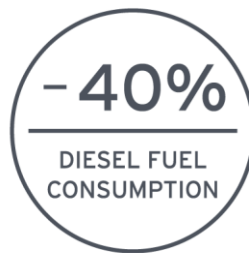
SUMMARY | ECONOMICAL ASPECTS

- ✓ Competitive system price and reduced CAPEX
- ✓ Reduced OPEX & generator runtime
- ✓ Reduction of fuel consumption costs up to 40%
- ✓ Reduction of grid energy costs up to 70%
- ✓ Remarkable payback periods (2 - 4 years)



SUMMARY | ECOLOGICAL ASPECTS

- ✓ Reduction of CO₂ emissions up to 40%
 - >>> Fulfillment of obligations and or selling of certificates
- ✓ Reduced dependency on diesel fuel
 - >>> Delivery and Import
- ✓ Increases social acceptance
 - >>> Hybridization of conventional power plants
 - >>> Ecotourism



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