

National energy network company NAT-EN

ROLE PURPOSE (CORE BUSINESS) : To produce and distribute electricity and gas

POSSIBLE ACTIONS (PROJECTS) : AGRO-F, BATT, BIOGAS, GEO, H-IND, HYDRO, PSPT, PTG, PV-RETAIL, REINFOR, SOLAR-F, WIND-T

RESOURCES : Financial power; storage capacities through long distance transfer of electricity (REINFOR)

CONSTRAINTS High operating expenses

KNOW-HOW AND EXPERTISE : Producing and distributing energy on a national scale

INITIAL FINANCIAL CAPACITY (K€) : 30 000 (related to local actions)

OPERATING EXPENSES (K€) : 6 000 (related to local actions)

INTERACTIONS WITH OTHER ACTORS



LA	Planning authorizations; Funding
NGO	Legal action from NGO
PC	PV-RETAIL
LOC-EN	Storage through REINFOR; Co-investment
FARM	Land; farm input for AGRO-F and BIOGAS
DEV	Electricity storage for D-LuxG and D-AffG

RECOMMENDED STRATEGY

NAT-EN operates on a national scale with more financial means than the local company LOC-EN but also with higher operating expenses for which they tend to favour big and profitable projects. The national operator is not motivated by the idea of local energy self-sufficiency but by profit-making as any company.

Their interconnection with the national energy grid enables them to transfer locally produced intermittent energy towards other territories or to store it in faraway reservoirs. But for this to be possible they must reinforce electric lines (REINFOR). As lines reinforcement doesn't bring in itself additional revenues they should try to share the investment with others.

POSSIBLE ACTIONS FOR NAT-EN

AGROFUEL		WIND TURBINES	
 AGRO_F	<i>Producing agrofuel from rapeseed</i> TYPE: Continuous energy production (Pc)	 WIND-T	<i>7 Wind turbines uphill</i> TYPE: Intermittent energy production (Pi)
	OTHER ENTREPRENEUR(S) : LOC-EN		OTHER ENTREPRENEUR(S) : LOC-EN
INVESTMENT COST (K€) : 700 GROSS ANNUAL INCOME : 5% (175 K€ per 5-year term) ENERGY PRODUCED (MWh / year) : 2 000 PREREQUISITE FACILITIES : R-FIELD LOCATION : 1 plot JOBS CREATED LOCALLY : 3		INVESTMENT COST (K€) : 8 000 GROSS ANNUAL INCOME : 8% (3 200 K€ per 5-year term) ENERGY PRODUCED (MWh / year) : 13 000 PREREQUISITE FACILITIES : Storage capacity 1 083 MWh LOCATION : 3 plots on a hill (column N) JOBS CREATED LOCALLY : 4	

ELECTRICITY STORAGE BATTERIES



Electricity storing capacity through batteries

TYPE: Energy storage (St)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 700

GROSS ANNUAL INCOME : -2% (-70 K€ per 5-year term)

ENERGY STORED (MWh) : 320

PREREQUISITE FACILITIES : none

LOCATION : 1 plot

JOBS CREATED LOCALLY : 3

GEOTHERMAL ENERGY



Recuperating heat from the ground

TYPE: Continuous energy production (Pc)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 500

GROSS ANNUAL INCOME : 8% (200 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 2 000

PREREQUISITE FACILITIES : none

LOCATION : 1 plot

JOBS CREATED LOCALLY : 4

HYDROKINETIC TURBINE IN THE RIVER



Hydrokinetic turbines immersed in the river

TYPE: Continuous energy production (Pc)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 2 000

GROSS ANNUAL INCOME : 5% (500 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 1 000

PREREQUISITE FACILITIES : none

LOCATION : In the river (no plot required). Risk to biodiversity.

JOBS CREATED LOCALLY : 4

POWER TO GAS



Energy storage between Summer and Winter through producing hydrogen with electricity (water electrolysis)

TYPE: Energy storage (St)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 1 100

GROSS ANNUAL INCOME : -2% (-110 K€ per 5-year term)

ENERGY STORED (MWh) : 270

PREREQUISITE FACILITIES : none

LOCATION : 1 plot

JOBS CREATED LOCALLY : 3

SOLAR FARM



Solar panels either on wasteland (including quarry) or on farming land

TYPE: Intermittent energy production (Pi)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 2 000

GROSS ANNUAL INCOME : 8% (800 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 2 800

PREREQUISITE FACILITIES : Storage capacity 233 MWh

LOCATION : 1 plot (wasteland, farmland, disused quarry J3)

JOBS CREATED LOCALLY : 3

BIOGAS



Production of biogas from biomass

TYPE: Continuous energy production (Pc)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 18 000

GROSS ANNUAL INCOME : 6% (5 400 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 10 000

PREREQUISITE FACILITIES : ANIMAL

LOCATION : One plot in rural area (including farmland). Odours in the neighbourhood (risk of residents opposition).

JOBS CREATED LOCALLY : 3

HEAT ORIGINATING FROM INDUSTRY



Recuperating heat from industrial process and injecting it in the Urban heating network

TYPE: Continuous energy production (Pc)

OTHER ENTREPRENEUR(S) : none

INVESTMENT COST (K€) : 700

GROSS ANNUAL INCOME : 8% (280 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 2 000

PREREQUISITE FACILITIES : IND-PR

LOCATION : IND-PR

JOBS CREATED LOCALLY : 4

PUMPED STORAGE POWER STATION



Storage facility: two successive dams with a sufficient level difference between the two

TYPE : Energy storage (St)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 1 000

GROSS ANNUAL INCOME : -2% (-100 K€ per 5-year term)

ENERGY STORED (MWh) : 250

PREREQUISITE FACILITIES : none

LOCATION : 2 plots with altitude difference : N and [M or L]

JOBS CREATED LOCALLY : 3

PHOTOVOLTAIC PANELS ON HYPERMARKET ROOF SPACE



PV panels on 10 000 m² flat roof space

TYPE : Intermittent energy production (Pi)

OTHER ENTREPRENEUR(S) : LOC-EN

INVESTMENT COST (K€) : 1 400

GROSS ANNUAL INCOME : 8% (560 K€ per 5-year term)

ENERGY PRODUCED (MWh / year) : 1 800

PREREQUISITE FACILITIES : HYPER; Storage capacity 150 MWh

LOCATION : HYPER

JOBS CREATED LOCALLY : 5

REINFORCEMENT OF HIGH VOLTAGE ELECTRICITY NETWORK



Reinforcing electric lines to allow outward transfer of renewable excess energy locally produced (wind turbines, solar panels)

TYPE : Energy storage (St)

OTHER ENTREPRENEUR(S) : none

INVESTMENT COST (K€) : 1 100

GROSS ANNUAL INCOME : -2% (-110 K€ per 5-year term)

ENERGY STORED (MWh) : 1 030

PREREQUISITE FACILITIES : none

LOCATION : No location constraint. Risk of neighbours opposition due to damage to the landscape.

JOBS CREATED LOCALLY : 0