United Nations Economic Commission for Europe

Financing Energy Efficiency Investments with the European Clean Energy Fund

International Seminar, Geneva, February 21, 2008

POTENTIAL PROJECTS

For the Utilization of Renewable Energy Sources in Bulgaria

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EnEffect consult

Potential Partners

16 potential partners contacted:

Municipalities: **4**

Private energy producers: **10**

Big energy consumers: **2**

Potential Projects

Municipalities:

DH, based on wood biomass

Wind and PV projects

Mini hydro-power plants

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DH based on wood biomass

Project 1:
7 MW_t with co-generation

Total investment: €10 million
PB=6 years; IRR=12%

Expected financing from EBRD for detailed design: €800,000

€5 million are searched for against 51% of the property

Contracts signed with 50% of the clients available

Survey on biomass potential / Concept design

Project 2:
2 x 7 MW_t , Investment cost: €7 million, PB=7 years (Pre-feasibility study)

Project 3:
25.4 MW_t, 3,2 MW_e, Investment cost: €19 million, PB=5.8 years (Pre-feasibility study)

Project 4:
5 MW_t, Investment cost: €5 million, PB=7 years (Pre-feasibility study)

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Private energy producers

PV Project 1:

Capacity: 5 MW

Investment cost: €21.4 million

PB=6.48 years

Building plot owned: 75,000 m^2

Concept design available

PV Project 2:

Total Capacity: 2.1 MW

Total investment: €7.32 million

PB=7.8 years, IRR=13.8%

Building plot owned: 32,600 m^2

Transformer station (250 kVA) available on the site

Distance to the existing electrical grid - 150 m

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Private energy producers

Wind:

Capacity - 11 MW

Investment costs €15 million, PB=5.6 years

Building plot owned: 70,000 m^2

Wind measurements since 2004 available

Concept design available

Preliminary contract for connection to the grid signed

Big energy consumers

Energy Efficiency (Cap and Trade System)

EU Directive 2003/87/EC

Allocation of emission allowances according to the NAP

GHG emissions permits issued for each installation – 178 installations on the whole

Control and penalties

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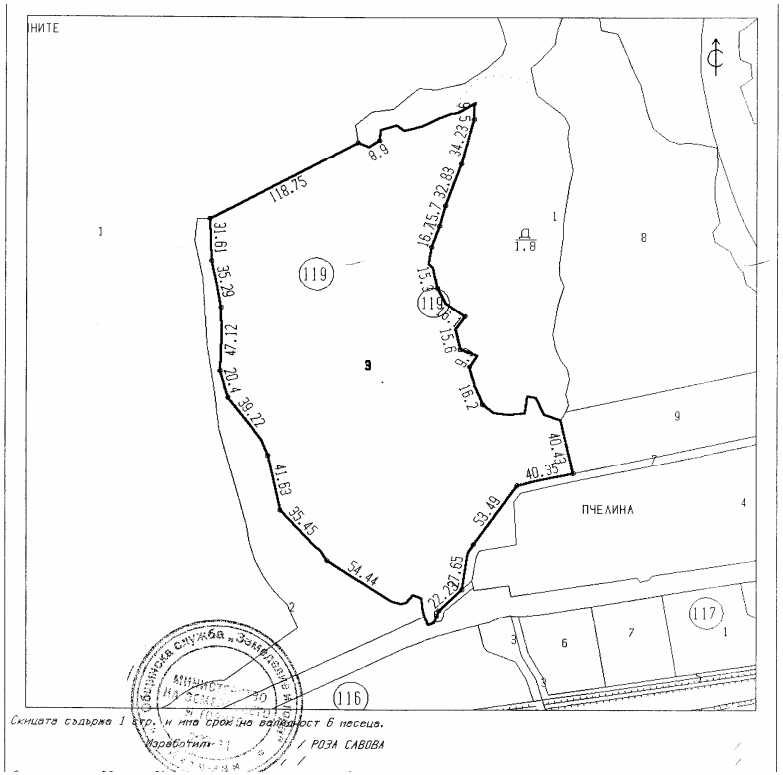
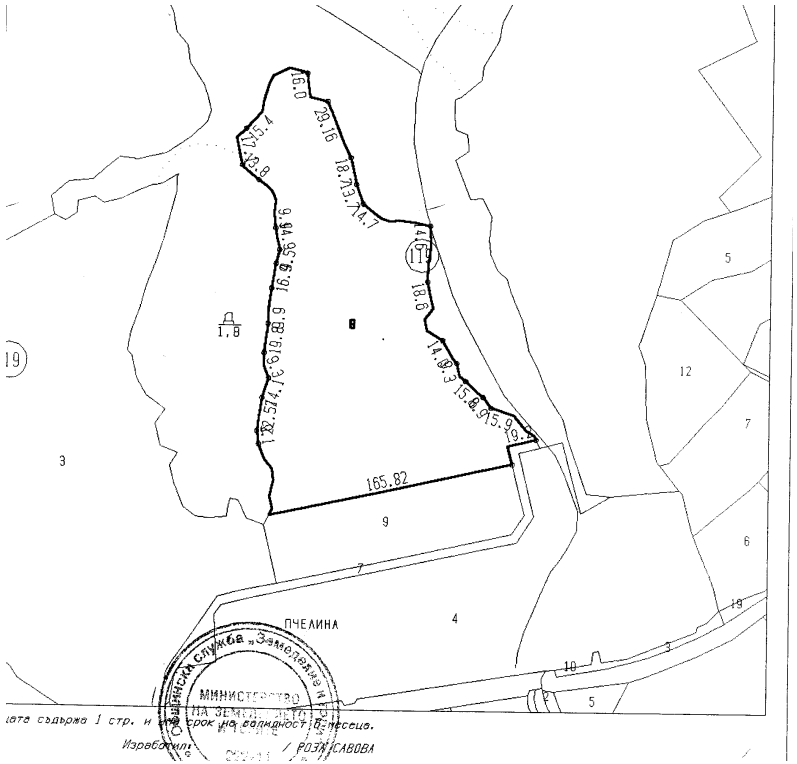
Example:

Developer: SunSERVICE Ltd.

Total area: 82,000 m^2

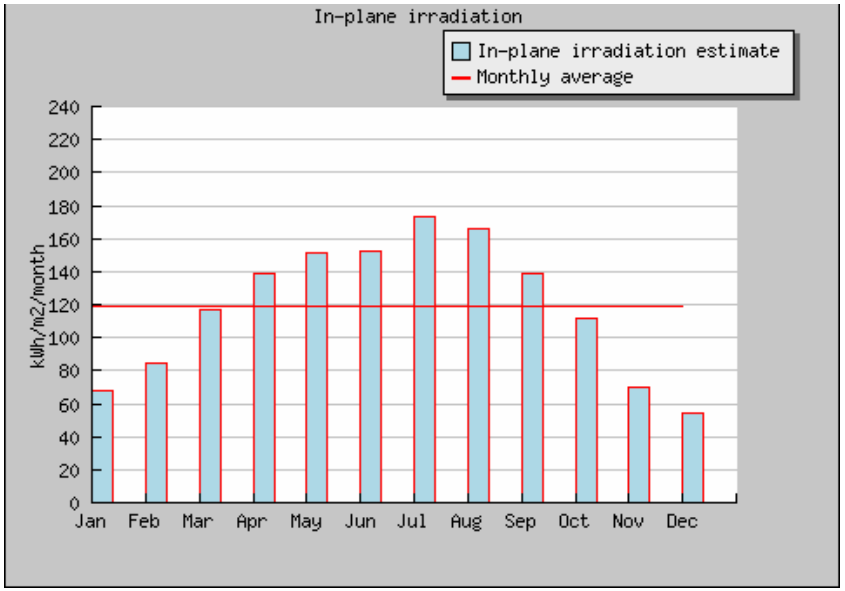


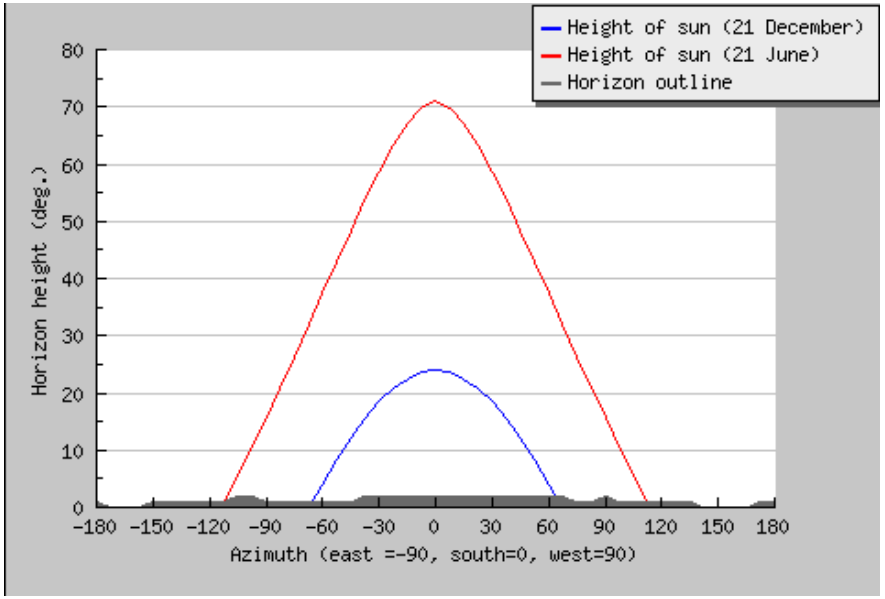


Example:

Developer: SunSERVICE Ltd.

PVGIS estimates of solar electricity generation





Example:

Developer: SunSERVICE Ltd.

Technology	Main parameters
Thin Film (Kaneka K60)	Solar radiation: 1,300kW/kWp
Morning shade / High summer temperature	Installed power: 1.404 MW
	Invertors' power: 1.3 MW
	Generated energy: 1,825,200 kWh/year
Permits and licenses available	Construction of reference unit in the adjacent site is foreseen

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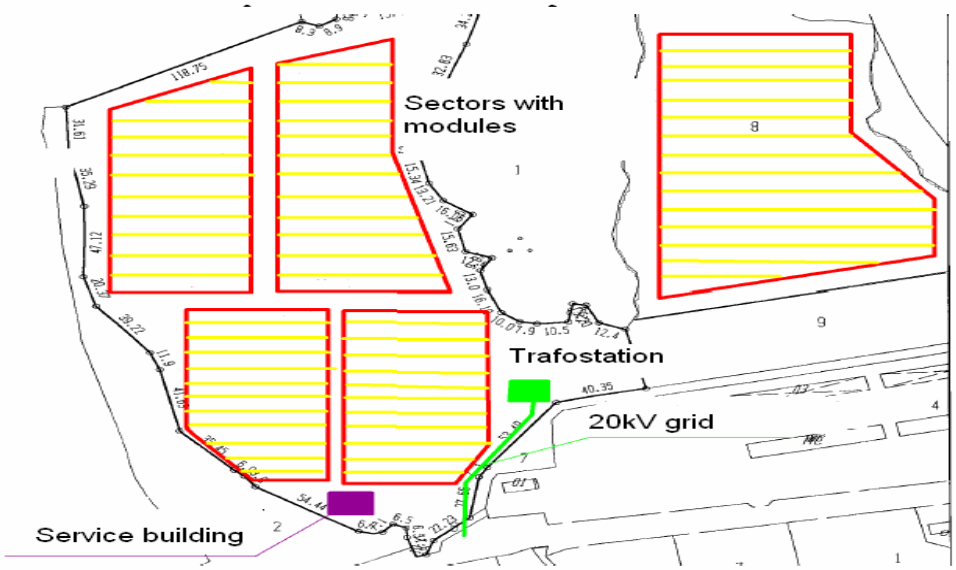
Example:

Developer: SunSERVICE Ltd.

Situation



Financial indicators:

Total investment cost:
€ 5,193,380

Annual incomes:
€ 669,848 per year

Project revenue:
€ 15,741,000

PB = 7.7 years, IRR = 12.12%

Conclusions

Findings:	Possible steps:
Relatively small projects	Assistance to projects bundling
Shortage of financing for FS and PD (relevant for municipalities)	Targeted support for project development
Lack of equipment & services for measurements of wind and solar intensity	Support for marketing, logistics, business plans development
Poor expertise for project development and evaluation	Support for measurements of wind intensity and solar radiation potential

Thank you

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