

Form1.

Summary of small-scale plant establishment plan

1. Introduction to products or services

1.1. The goal of plan

The main goal of this plan is to establish CHP plant with 16 MW generation power for electricity generation consumed in Lorestan province. This plan will be exploited from 2017 with 100% of the practical capacity. The distributed generation plant with 8760 working hours annually, supplies the electricity required by industrial and residential units.

1.2. Characteristics and advantages

Distributed generation refers to electricity generation from small energy sources. DG refers to the cases in which the electricity is consumed in situ or in near zones. DG is a small-scale plant with maximum generation power of 25MW. DG was created due to the fact that in some places, the current and voltage drop was seen. This plan is for bridging these gaps. DG is divided into CHP and CCHP. By simultaneous generation it means electricity generation along with other energies and making use of them simultaneously. The simultaneous generator is a generator whose heat waste is directly used or recycled for water warming, steam and other applications. Among the advantages of this plan is the effective electrical gain 1.5 times more than the heat plant. At present, developed countries supply major part of their electricity in large-scale concentrated plants such as fossil fuel (coal, gas), nuclear or aquatic electricity plants. These plants minimize the costs well, but electricity is transferred to remote sites and influences the environment. It is necessary to note that diesel generators in factories and different industries are not capable of annual constant generation of electricity and being connected to global electricity network due to technical issues and in fact, they are used as emergency electricity generators. While small-scale electricity generators are capable of constant generation during the year and constant electricity generator with gas as fuel has high power and guarantees more than 80 thousand hours. Increasing costs of transfer and distribution provides the distributed generation generators with this possibility to provide the families with the low-cost electricity.

1.3. Custom fees and tariffs

The product of this plan (electricity energy) lack custom fees and tariffs.

1.4. ISIC code

The plant considered is for electricity generation. The ISIC code related to this product is 3110 in the department of industry, mine and commerce systems in subgroup electrical engines, generators and transformers and its measurement scale is device.

Table1. Product ISIC code

ISIC code	Description	Scale
	Small-scale combined heat and power small-scale generator	device

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1.5. Introduction to products application

Among the applications of the small-scale generators are:

- Demand and energy costs minimization
- Reliability increase including emergency power supply
- Distribution and transfer network wastes reduction
- Minimizing rotating and non-rotating reserve
- Increasing peak disconnecting loads
- Reducing or eliminating the demand to distribution and transfer network development
- Reactive power generation and power quality improvement
- Combined heat and electricity generation capability
- Electricity company load coefficient improvement
- Distribution in required primary energy sources
- Reduction of contaminants
- Line density reduction
- Emergency set up capability
- Quick time response

2. Suggested sites

Based on surveys, the cities such as Khoramabad and Sarab Doreh are suitable sites for establishing this unit.

3. Raw, auxiliary materials and consumables

Raw materials for electricity generation are gas, oil, oil filter, fuel filter and air filter.

4. Sales plan and target market (local and foreign)

The target market at first is to supply locally.

Table2. Products production and sales plan

Generations	Scale	Annual capacity	Wholesale price (Rial)	Total annual generations value (m.Rial)
Electricity	Kwh	133693818	1000	133694
Total annual income				133694

The guaranteed purchase rate of electricity in small-scale plants and DG for low-pressure plants is 1000 Rials per 1 kWh.

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5. Annual nominal and practical capacity

Nominal capacity

The Nominal capacity is the production in ideal situation. This capacity is registered by the machineries manufacturers and is based on the engineering and designing principles which is 2110 kWh.

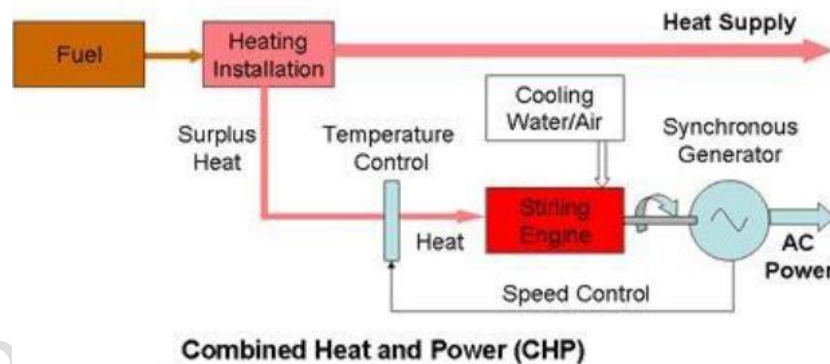
5.2. Practical capacity

The practical capacity is the maximum available capacity in typical situation which is considered as a percentage of the nominal one. In order to calculate the practical capacity of the electricity generator is obtained from:

$$\text{Practical capacity} = \text{nominal generator capacity} \times \text{power reduction coefficient due to generator} \times \text{annual coefficient}$$

The nominal capacity for this generator is 1025 kWh annually and therefore, the total capacity of 16 devices is 16400 KW. The guaranteed annual availability is 0.95 and the annual coefficient is 00.5% (applied from 2nd year).

6. Production procedure and technology



7. Investment costs

7.1. Fixed investment

Table3. Investment costs

No.	Description	Costs			
		Dollar	Rial	Rial	Total
1	Land	0	0	1250	1250
2	Landscaping	0	0	1360	1360
3	Building construction	0	0	6100	6100

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4	Machineries and equipment	8672000	339942	16997	356940
5	Branches and installation	0	0	5060	5060
6	Vehicles	0	0	0	0
7	Service and official equipment	0	0	310	310
8	Other and unpredicted costs (5% of above costs)	0	0	18551	18551
9	Pre-exploiting costs	0	0	3300	3300
10	Total fixed investment costs	8672000	339942	52928	392870
11	Working capital in 100% of capacity	0	0	4082	
12	Total investment costs	8672000	339942	57010	396952

7.2. Working capital

Table4. Working capital

No.	Description	Day	1 st year	Base year
1	Raw and auxiliary materials	30	147	147
2	Current and produced products inventory	1	45	45
3	Debts	60	2706	2706
4	Cash	30	1197	1197
	Total		4095	

8. Production costs

Table5. Production costs

Description	Total costs (m.Rial)
Raw and packing material	1768
Energy	99
Repair, maintenance and spare parts	7897
Personnel's salary	4856
Unpredicted (6%)	877
Depreciation	24498
Insurance	737
Total operational and non-operational production costs	40732

9. Economic indices

Description	Amount-measurement scale
NPV	49434 m Rial
IRR	26.46%
PBP	4.62 years

PROJECT PROFILE – SUMMARY SHEET

Project Introduction

1. Project title: establishment of the small-scale plant establishment plan factory with capacity of 10 MW
2. Sector: manufacturing electrical machineries and non-classified electrical devices elsewhere
Sub sector: manufacturing electrical engines, generators and transformers
3. Products/Services: electricity power
4. Location: ... Free zone Economic special zone Industrial Estate Main Land
5. Project description:
Distributed generation refers to electricity generation from small energy sources. DG refers to the cases in which the electricity is consumed in situ or in near zones. DG is a small-scale plant with maximum generation power of 25MW. DG was created due to the fact that in some places, the current and voltage drop was seen. This plan is for bridging these gaps. DG is divided into CHP and CCHP. By simultaneous generation it means electricity generation along with other energies and making use of them simultaneously. The simultaneous generator is a generator whose heat waste is directly used or recycled for water warming, steam and other applications.
6. Annual capacity: 2110 kW / year

Project Status

7. Local / internal raw material access 100 %
8. Sale: 100% locally
- Anticipated export market 0 %
9. Construction Period 1 Year
Beginning of activity: 03/2017
In-site beginning of activity: 03/2017
End of project: 02/2018
Commercial activity beginning: 03/2018

Project Status

10. Project Status:

- Feasibility study available? Yes No
- Required land provided? Yes No
- Legal permissions (establishment license, foreign currency quota, environment, etc) taken? Yes No
- Partnership agreement concluded with local/foreign investor? Yes No
- Financing agreement concluded? Yes No
- Agreement with local / foreign contractor(s) concluded? Yes No
- Infrastructural utilities (electricity, water supply, telecommunication, fuel, road, etc) procured? Yes No
- List of know-how, machinery, equipment, as well as seller / builder companies defined? Yes No
- Purchase agreement for machinery, equipments and know- how concluded? Yes No

Financial Structure

11. Financial Table

Description	Local Currency Required			Foreign Currency Required Million Dollar	Total Million Dollar
	Million Rials	Rate	Equivalent in Million Dollar		
Fix Capital	52928	34530	1.53	984	11.38
Working Capital	4092	34530	0.12	0	0.12
Total Investment	57011	34530	1.65	984	11.50

- Value of foreign equipment/machinery 9.84million Dollar
- Value of local equipment/machinery 0.49 million Dollar
- Value of foreign technical know- how 0 million Dollar
- Value of local technical knows- how 0 million Dollar
- Net Present Value (NPV): 49434 Million Rial for Year
- Internal Rate of Return (IRR) 26.46%
- Payback Period (PP) 4.62 Year

General Information

12. Project Type : Establishment Expansion and completion

13. Company Profile:

- Name (legal /natural persons): Sepinud Shargh institute of strategic studies
- Company Name: engineering consultation
- Address: unit 5, No. 3, Boostan 3 St., Pasdaran, Tehran
- Tel: 02122584901 Fax: 02122580343
- E-mail: info@sepinud.com Web site: www.sepinud.com
- Local entrepreneur : private sector public sector other

Please attach follow documents if available

- Pre feasibility study
- Feasibility study
- Legal permissions (establishment license, foreign currency quota, environment, etc)

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