

Master Thesis


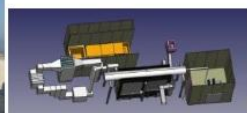
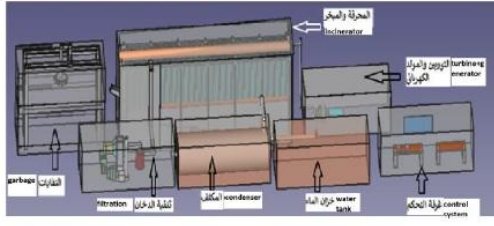

Market analysis in Middle East for incineration electrical power plants

Ras Nhache, Batroun/Tripoli, 22.02.2017

The Lebanese start-up company North Lebanon Alternative Power produces incineration power plants and wants to come on the Middle East market.

المنتجات: محطات طاقة كهربائية عن طرق حرق النفايات بأحجام مختلفة

Products: Incineration power plants

سعر Price	حجم توليد الكهرباء Electrical Power of Plant	حاجة النفايات للحرق Minimum Waste Needed for incineration	العدد التقريبي من المواطنين يغذى بالكهرباء Number of citizens supplied with electricity	
100.000 \$ - 300.000 \$	100 kW	150 kg/h 150 كيلوغرام بالساعة	500	 
4-6 Mio. \$	1.5 MW	1,5 t/h 1,5 طن بالساعة 30 tons per day	7500	 مساحة المطروبة: 25 متر على 6 متر ، اقصى العلو: 5 متر Ground: 25 m x 6 m, maximal height 5m
12-16 Mio.S	15 MW	300 tons per day	75 000	
20-25 Mio.\$	40 MW	850 tons per day	200 000	

The master thesis includes market analysis and governmental regulations concerning waste incineration and for electricity supply for Middle East countries.

Tasks:

- **Identifying potential Customers**

- Lebanon

Potential customers in North Lebanon are municipalities which actually offer their citizens electricity when Lebanese electricity does not offer (all 4 hours) or which have lacks in electricity supply.

Name	Contact	Actual electricity need	Remarks	Required power plant, Return of Invest Range
بلدية القلمون	باسم العلي (نائب رئيس البلدية) 03/312275	100 kW (Balamand Schools)	Meeting in Qalamoun	300dx12hx100kWx0,2\$/kWh = 72,000 \$ income per year, after 5 years 360\$
...				

The table must be filled.

- Turkey, Jordan, Syria, Iraq, Egypt, Marrokko, Algeria, Saudi Arabia, UAE, Kuwait, Oman, Bahrain, Jemen

Name	Contact	Actual electricity need	Remarks	Required power plant, Return of Invest Range
...				

The table must be filled.

- Gaza (material transport by Turkey possible)
- Remark: Lybia actually not possible due to political situation (phone call with Abdulfattah Ammar (former major of Az-Zawiya) on 4.1.2017, Tel +218913788245)

- **Market needs, trends and growth**

For Turkey, Jordan, Syria, Iraq, Egypt, Marrokko, Algeria, Saudi Arabia, UAE, Kuwait, Oman, Bahrain, Jemen

E.g. Saudi-Arabia:

Saudi Arabia has very recently and very quickly become an industrialized nation. The demand for power is swiftly increasing (in 1999 alone it grew by 12%). The country has been spending between \$3bn and \$4bn dollars on expansion per annum

Planning of projects:

Saudi Arabia intends to carry out 16 key power projects in its eastern province of Ihsa over the next three years to meet a steady growth in domestic electricity demand, according to a Saudi official.

The government-controlled Saudi Electricity Company (SEC) is also planning to construct 14 other power generation plants in Ihsa during 2017-2021, said Sadeq Al Hajji, director of the power networks planning at SEC.

He was quoted by the Arabic language daily Al-Watan as saying in a lecture at Isha chamber that the projects in the next three years cover various cities and villages in the province, including Al Salmaniya, Al Ghassaniya, Ain Al Murjan, Al Khalidiya, Al Qadissiya, Al Masoudi, Nada and other areas.

He said the projects are needed to face a steady rise in domestic demand and supply power to new residential areas.

His figures showed massive investments in the electricity sector in the world's largest oil exporter have boosted power generation by nearly 108% over the past 12 years.

Source: www.zawya.com

• Governmental regulations

- For Turkey, Jordan, Syria, Iraq, Egypt, Marrokko, Algeria, Saudi Arabia, UAE, Kuwait, Oman, Bahrain, Jemen

E.g. Lebanon:

الوضع القانوني في لبنان

• الانبعاثات يجب ان تخضع القوانين البيئية

Valeurs limites à respecter lors de l'incinération des ordures ménagères الحدود القصوى المسموح بها لمكونات الهواء في الانبعاثات الناتجة عن حرق النفايات المنزلية						Capacité de l'incinérateur طاقعة الاستقبال	
>3 tonnes/H أكثر من 3 طن/ساعة		1-3tonnes/H من 1 إلى 3 طن في الساعة		<1 tonne/H أقل من طن في الساعة		Element	الملوث
Valeur maximale mg/m ³	الحدود القصوى ملغ/متر مكعب	Valeur maximale mg/m ³	الحدود القصوى ملغ/متر مكعب	Valeur maximale mg/m ³	الحدود القصوى ملغ/متر مكعب		
30	30	100	100	200	200	Poussières totales	الجسيمات العالقة الكلية
5	5	5	5	-	-	Pb+Cr+Cu+Mn	رصاص+كروم+نحاس+منغنيز
1	1	1	1	-	-	Ni+As	نيكل+آزوتين
0,2	0,2	0,2	0,2	-	-	Cd+Hg	كادميوم و زئبق
50	50	100	100	250	250	Cl en HCl	كلور (كحامض هيدروكلوريك)
2	2	4	4	-	-	F en HF	فلور (كحامض هيدروفلوريك)
300	300	300	300	-	-	SO ₂	ثنائي الكبريت

D: limits of emissions in Lebanon

• الكهرباء يمكن ان تباع عبر شبكة خاصة او باتفاق مع شركة الدولة

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