

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



طاقة الشمال

North Lebanon Alternative Power

www.nlap-lb.com

Subject: Project Proposal (March 2018)

Project title: Rihaniye Camp

Waste incinerator 1 ton/day, 25 kW electricity (NLAP-IPP Demo Plant)

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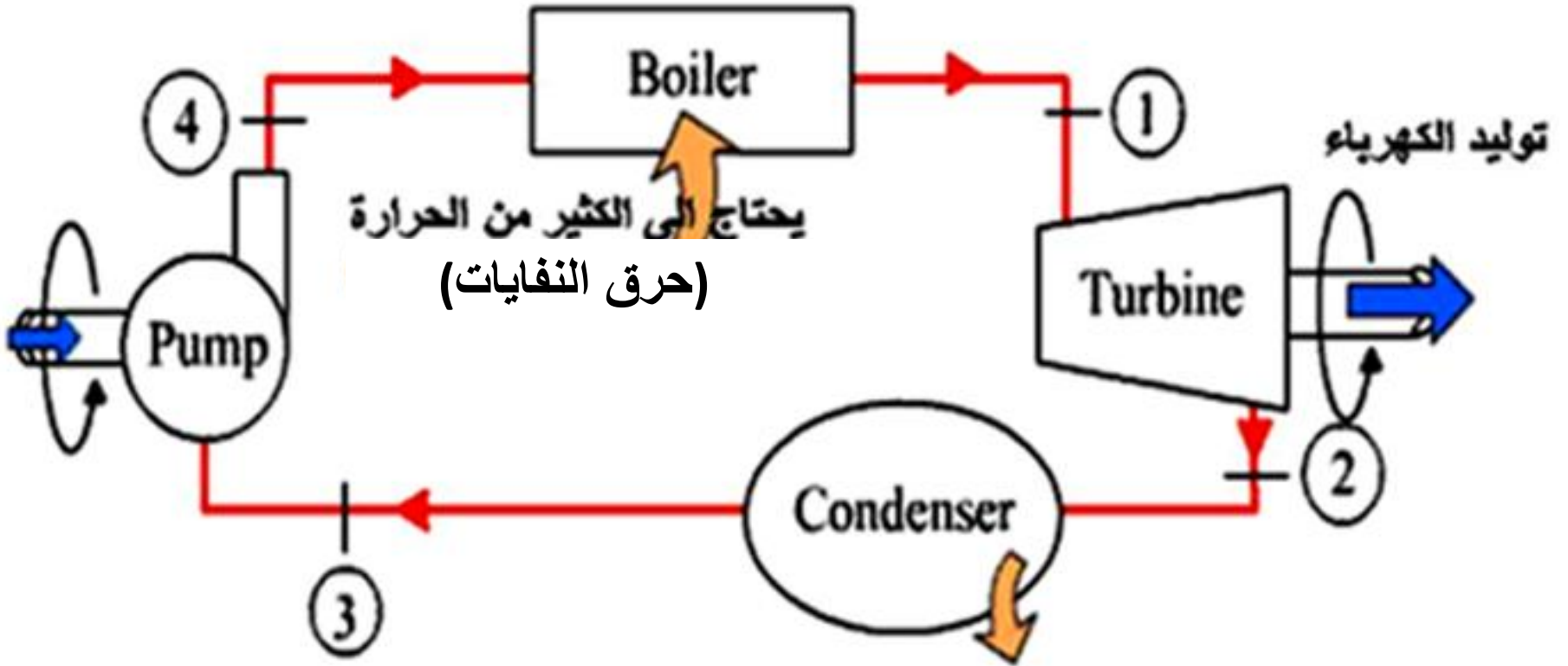
First Member: URDA

Second Member: NLAP Company

Project overview

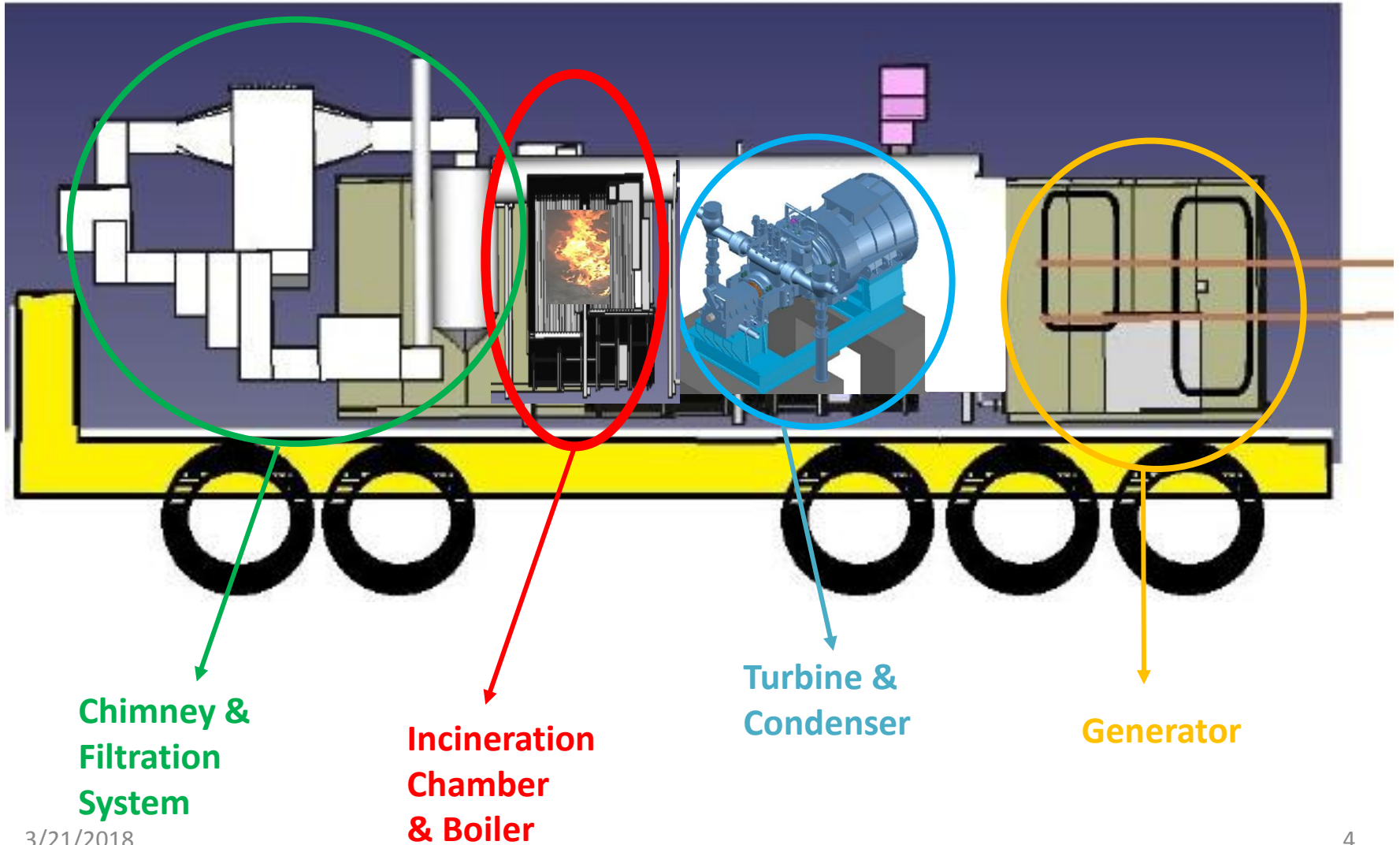
- The plant eliminates about **1 (tons/day)** of camp waste (depending on their type).
- The plant includes a **filtration system** to fulfill the Lebanese and International requirements and norms concerning smoke emissions.
- Incineration remnant (**Smoke and Ashes**) are **recycled**.
- Optional Expandability: **Electrical power** generating plant, hot water **Heating** system, **Hydrogen** production plant....

Theoretical Plant



تبريد البخار (بئر ماء)
و يمكن الاستفادة من الحرارة لتسخين الماء (Heating)

Overview (Basic Plant)



Experimental mobile Plant NLAP-IPP



IN		OUT	
Type	Quantity	Type	Quantity
Waste	1 ton/day	Electricity	25 kW
Cooling Water	10 m ³ /day	Smoke (Dust)	< 170 mg/m ³
Electricity	2 kW	Ashes	300 kg/day (30% M, 10% V)
		Hot Water	10 m ³ /day

ملوثات الهواء المسموحة الناتجة عن حرق النفايات

Valeurs limites à respecter lors de l'incinération des ordures ménagères

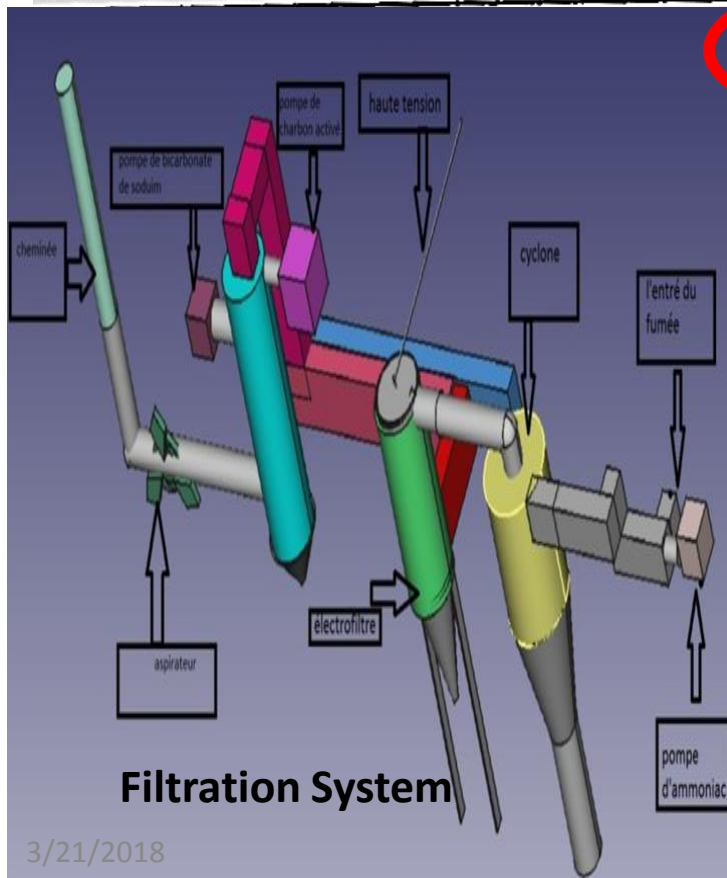
الحدود القصوى المسموح بها لملوثات الهواء في الانبعاثات الناجمة
عن حرق النفايات المنزلية

Capacité de l'incinérateur
طاقة الاستيعاب

<1 tonne/H

اقل من طن في الساعة

الملوث	Element	الحدود القصوى ملغ/ متر مكعب	الحدود القصوى mg/m ³
الجسيمات العالقة الكلية	Poussières totales	٢٠٠	200
رصاص+كروم+ نحاس+مانغانيز	Pb+Cr+Cu +Mn	-	-
نيكل+زرنيخ	Ni+As	-	-
كاديوم وزئبق	Cd+Hg	-	-
كلور (كحامض هيدروكلوريك)	Cl en HCl	٢٥٠	250
الفلور (كحامض هيدروفلوريك)	F en HF	-	-
ثاني أكسيد الكبريت	SO ₂	-	-



مساحة الأرض المطلوبة (حوالي 500 متر مربع)



Incinerator Dimension:

14 m x 3 m

Separation Room

5.5 m x 3 m

Funding utilization and milestones

Date	Milestone		Funding need
20 March 2018	Ground preparation	Infrastructure	2000 \$
26 March	Transportation, Training waste separation	Logistic, Education	700 \$
2 April 2018	Installation (assembly, welding parts, Components controls...)	Incinerator plant project	500 \$
9 April	Insulation (Incineration Ch., Evaporator, Condenser, Chimney...)	Incinerator plant project	1200 \$
16 April	Water supply & Accessories (Tank, Pump, Pipes, Filtration & Demineralization RO)	Incinerator plant project	2000 \$
23 April	Process Control System (Valve, Sensor, Display, Electronic devices & software) installation	Incinerator plant project	600 \$
30 April	Smoke filtration System & Tests (with AUB)	Incinerator plant project	1500 \$
May –June 2018	Operating the System (see Staff Costs) *	Incinerator plant project	
Total			8500 \$

Staff Costs

* Staff Costs / month

Task	Number	Qualification	Salary/month
Project manager	1	Eng. expert	NLAP internal
Developers	2	Master Physics, Eng.	NLAP internal
Waste Separation employees	1	Unlearned worker	300 \$
Machine Operators	4	Unlearned worker	4x300\$= 1200 \$
Maintenance		Technicians: (Plumbing, Welding, Electricians...)	300 \$
Total Man Salary/Project	8		1800\$ + NLAP internal staff cost