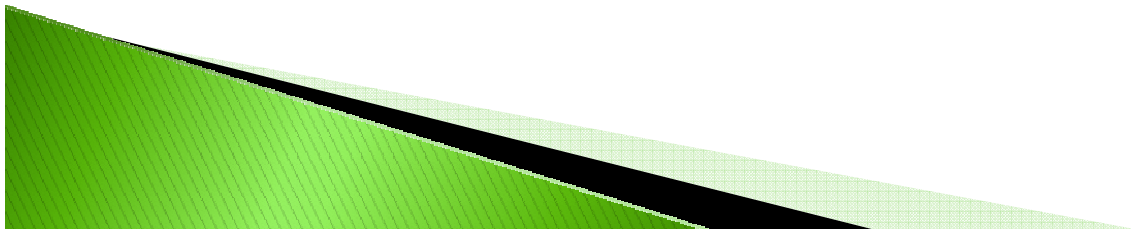


# Partnership with Private Sector

Success story in the field  
of Green technology



**GREEN ENERGY (BIODIESEL) PROCESSING MACHINE INNOVATOR IN ETHIOPIA**



**WIPO**

WORLD  
INTELLECTUAL PROPERTY  
ORGANIZATION

**WIPO AWARD  
FOR INNOVATIVE ENTERPRISES**

**YME PRODUCT DESIGN  
AND MANUFACTURING PLC.**





WIPO AWARD FOR INNOVATIVE ENTERPRISES

**CERTIFICATE**

We hereby certify that

**YME Product Design and Manufacturing PLC.**

is awarded the WIPO AWARD FOR INNOVATIVE ENTERPRISES in recognition of its innovative and successful contribution to the biodiesel technology in Ethiopia

presented on the WIPO Competition "Innovation Solutions for Everyday Life" organized by The World Intellectual Property Organization (WIPO)

The Korean Intellectual Property Office (KIPO) in collaboration with The Ethiopian Intellectual Property Office (EIPO)

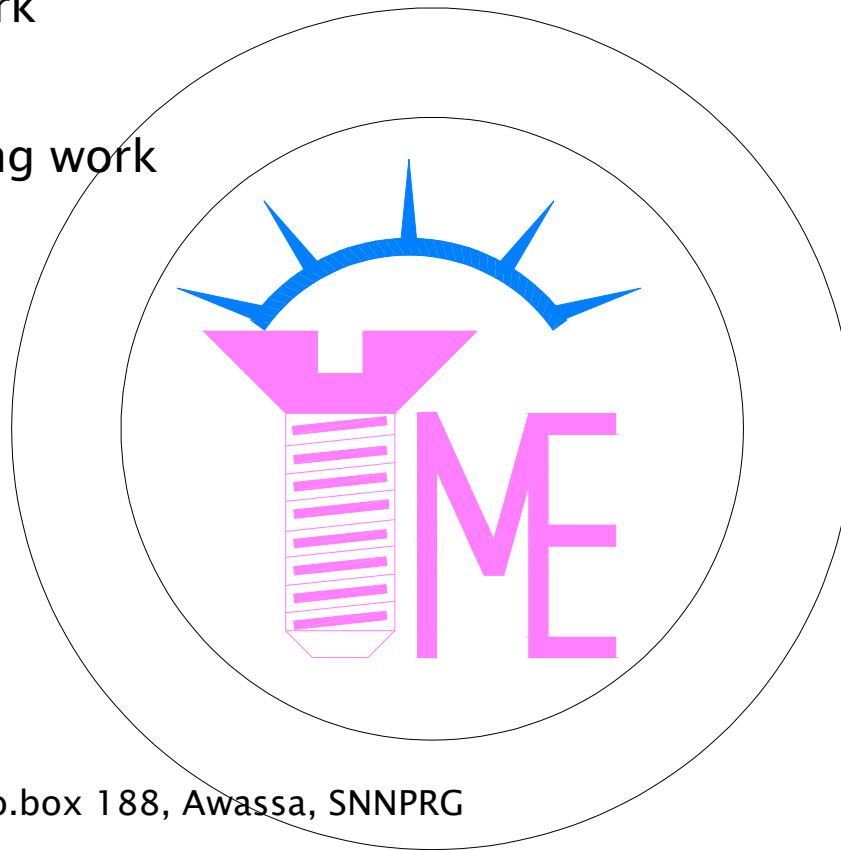
Francis Gury  
Director General  
WIPO

Addis Ababa  
June 2011

# YME product design and manufacturing

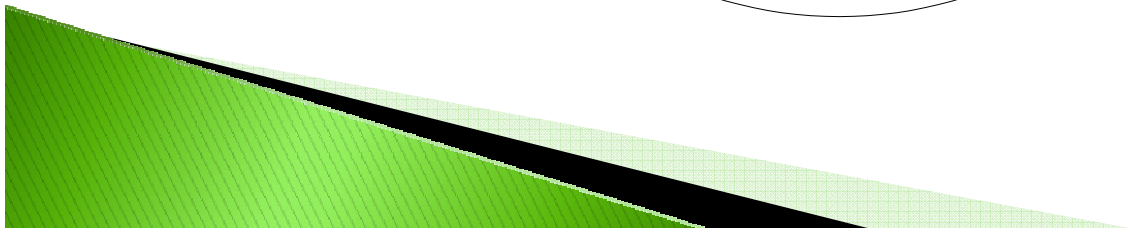
For

- Research work
- Design work
- Manufacturing work



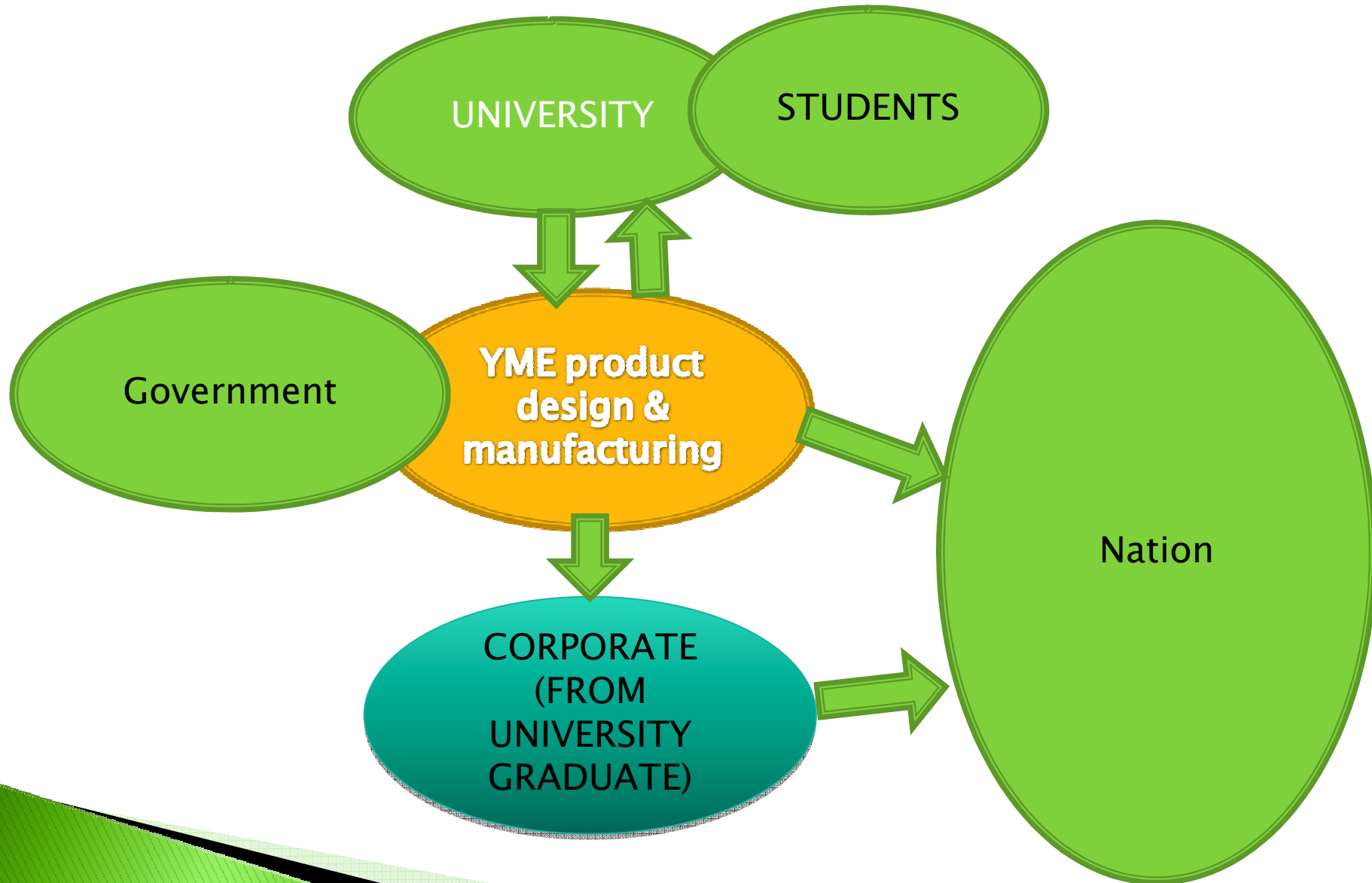
Address:- p.o.box 188, Awassa, SNNPRG

[ymeawassa@gmail.com](mailto:ymeawassa@gmail.com)



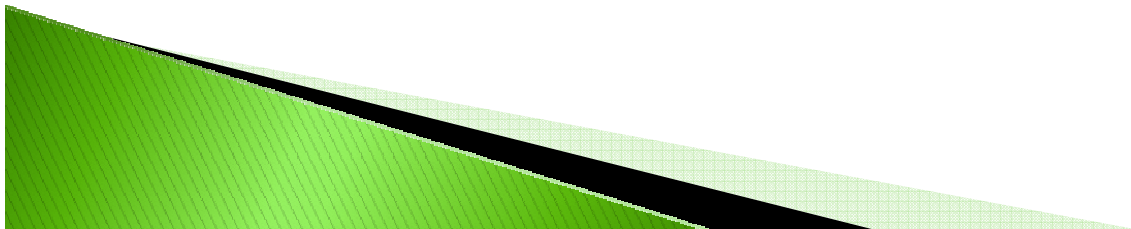


# YME Relation With Others



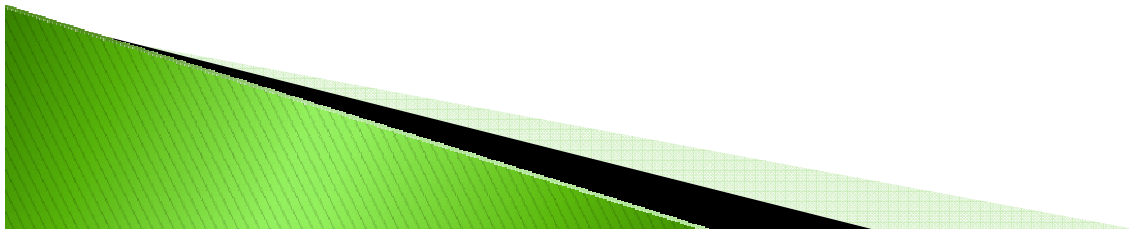
# YME at 2007

- ▶ established by Eshetu Dessalegn (Mechanical Engineer and lecturer)
- ▶ Start up of YME  
capital 300USD and 2 worker (owner and assistant).
- ▶ Focused on financial capacity building



# Current status of YME (after 5 years)

- ▶ 1. Metal fabrication workshop
  - ❖ 20 workers and 100,000USD capital.
  - ❖ Mainly produce biodiesel machines and equipments
- ▶ 2. Soap and detergent factory
  - ❖ 10 workers and 70,000USD capital
  - ❖ it uses biodiesel byproduct and non-edible oils
- ▶ 3. Two Concrete Hollow block (CHB) production Site
  - ❖ 50 workers and 110,000USD capital
- ❖ 4. Biodiesel and CBG factory
  - ❖ 100,000 lit/year capacity pilot project is working with 300 out growers by planting 20hect. jatropha
  - ❖ 1.5million USD capital project is going on with plantation of 600hectar non-edible oil plants to produce 700,000lit/year biodiesel which start 2014.



# The 1<sup>st</sup> innovative product of YME



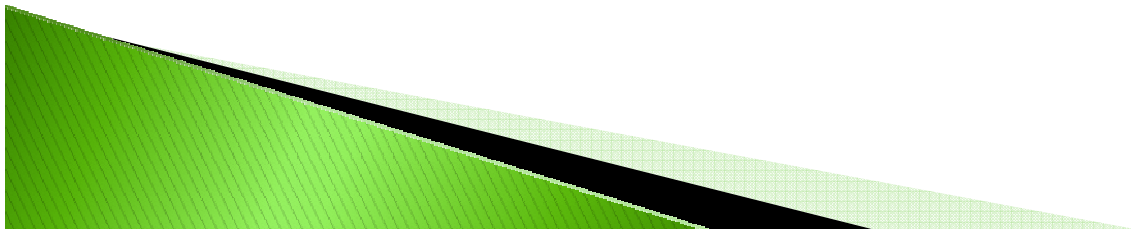
Model 01:- Solid waste collector

Unit price =11.75 USD

1<sup>st</sup> Sells Qty=50pcs

# Second Set of Products

## Simple Engineering Laboratory Equipment





# Metal Fabrication Workshop



**YME product design and Manufacturing**

# Riffle box



To divide construction material samples into two equal quantities for laboratory purpose

# Model 02 Solid waste collector





# Furniture

Double bank bed



Lecture hall chair



Cinema hall chair



Multi-purpose  
movable board



Drafting table & chair



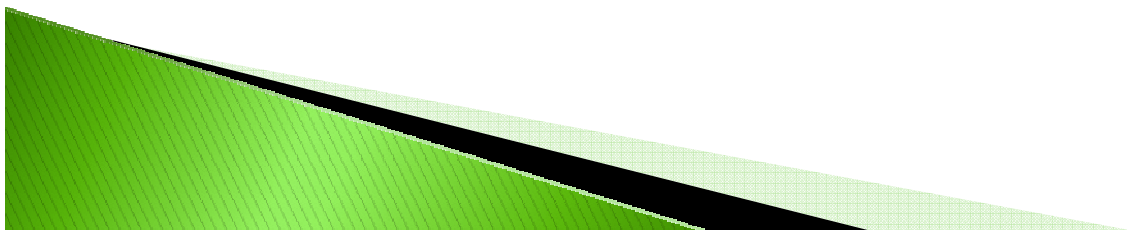
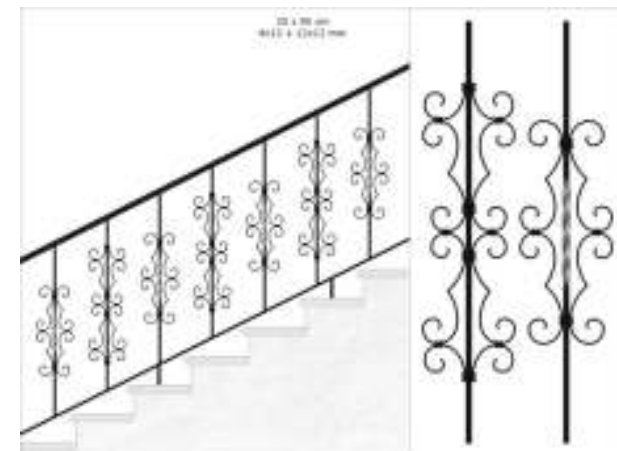
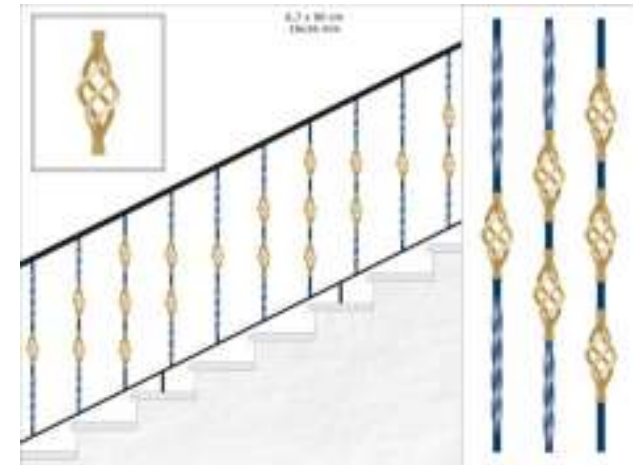
Foldable window  
shutter

# Metal works

- ▶ Window grill



- ▶ Staircase handrails





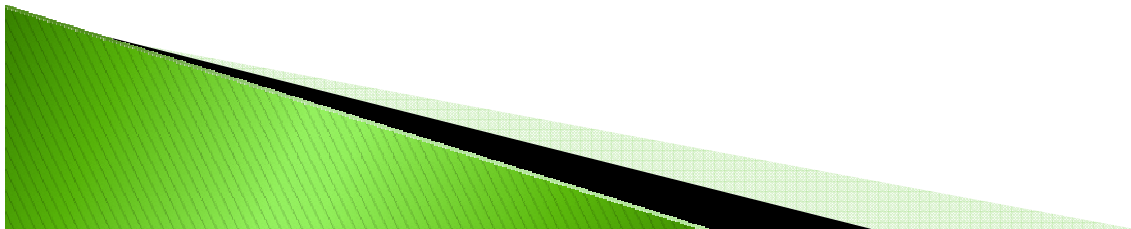
# Soap and detergent

- ▶ Liquid detergent one of YME product



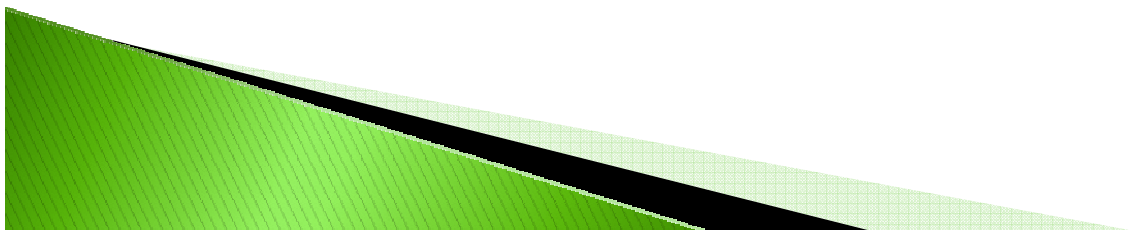
YME dream to

# Green Technology



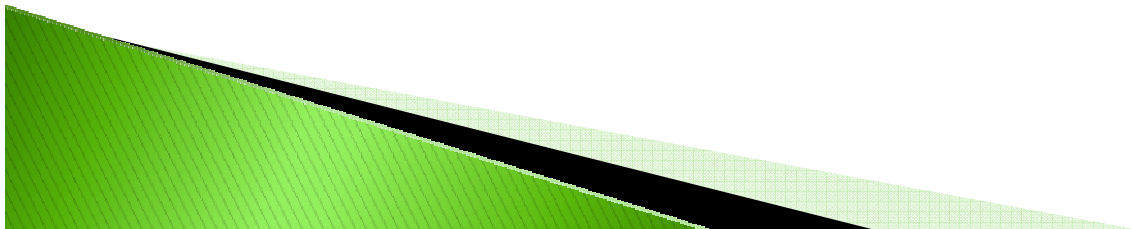
# YME vision.....

- ▶ Substituting fossil fuel with Bio-diesel and compressed biogas (CBG)
- ▶ Substituting chemical fertilizer with organic fertilizer made of biodiesel by-product Seedcake
- ▶ Manufacturing of Organic soap made of biodiesel by-product Glycerin



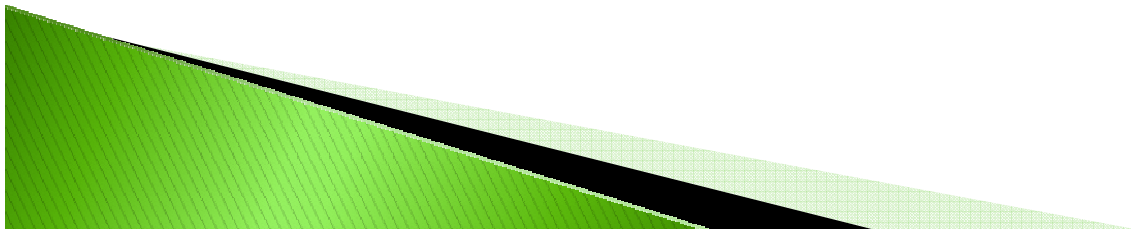
# The Contribution of Our biodiesel project

- ▶ 1. To save the world from Global warming
- ▶ 2. To decrease world fuel conflict
- ▶ 3. To save developing country diesel price fluctuation
- ▶ 4. To save our county, Ethiopia from petrol diesel dependency.



# Fossil fuel and global warming

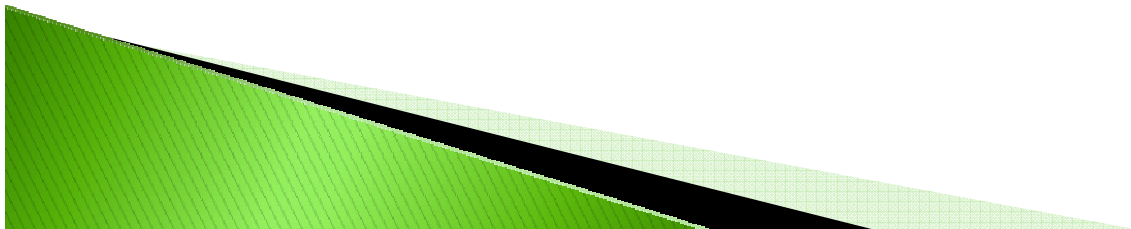
- ▶ Global warming is the increase in the average temperature of earth's near surface air and oceans, caused by increasing concentrations of greenhouse gases, which result in mainly burning of fossil fuel.
- ▶ The effect of this Climate Change May be either physical, ecological, social or economical.





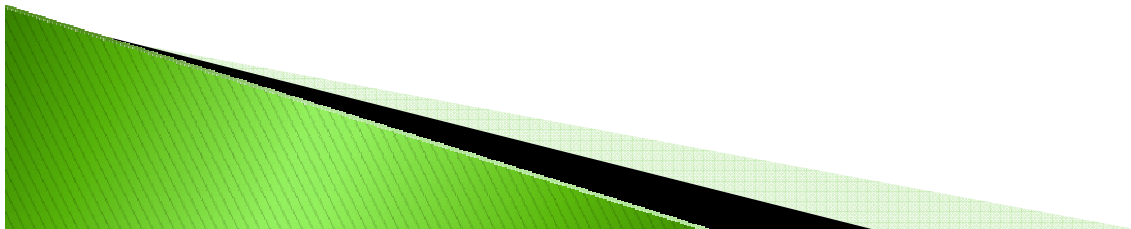
# Some of Effects:-

- ▶ Sea level rise and coastal flooding
- ▶ Weather change and decrease agricultural yield
- ▶ Increase Desert
- ▶ Decrease mountain snow-pack (shortage of drinking).flow of fresh water.
- ▶ Increase the risk of vector borne disease.
- ▶



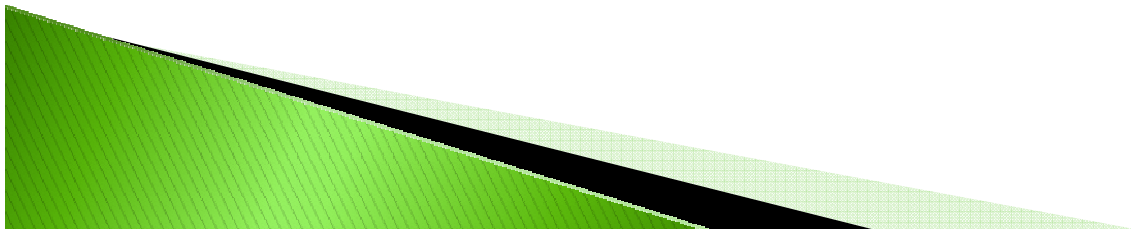
# Ethiopia And Petroleum diesel

- ▶ Ethiopia is not a petrol–diesel producing country so on average imported about 1 billion liter petrol diesel annually.
- ▶ Consumes more than 90% of money earned from export market.
- ▶ Ethiopia will cost a lot of money to import diesel. And the increase of fuel price will affect mainly non–oil producing developing country like Ethiopia. So substituting fuel with locally produced bio–fuel is burning issue in these countries.



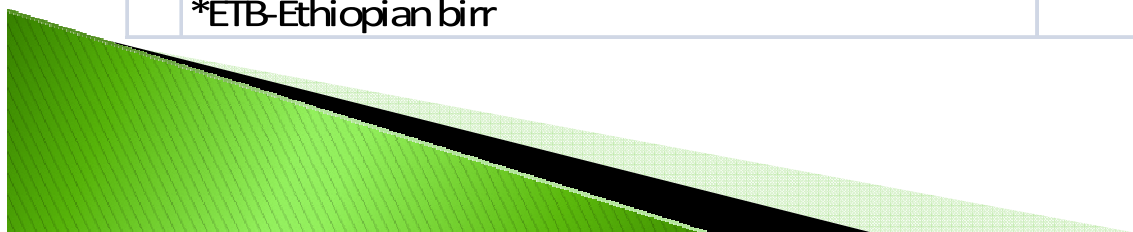
# The last 5 year petroleum import('000lit)

2008	2009	2010	2011	2012
851,381	927,936	1,107,193	1,119,673	1,341,129



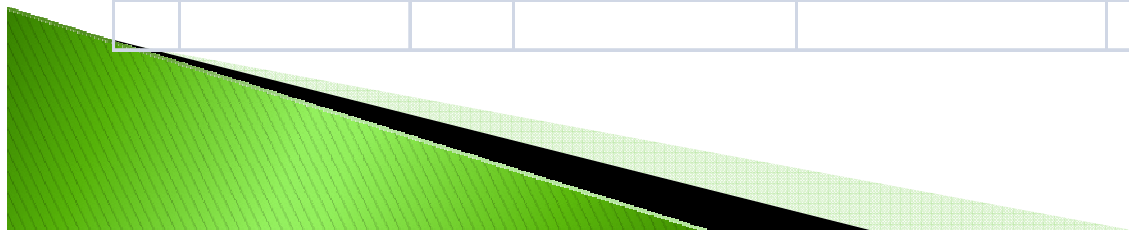
# Ethiopian The next 4 year fuel demand

No	Description	Unit	Years				Remark
			2013	2014	2015	2016	
1	Required petrol diesel	lit	2,774,990,000	5,044,713,333	5,347,300,000	7,820,000,000	
2	Required money to purchase diesel	ETB	44,399,840,000	80,715,413,333	85,556,800,000	125,120,000,000	1L=16ETB
3	Required money to purchase diesel	USD	2,611,755,294	4,747,965,490	5,032,752,941	7,360,000,000	1USD=17ETB
Total money required to purchase diesel=						335,792,053,333	ETB
						19,752,473,725	USD
*ETB-Ethiopian birr							



# Ethiopian Biodiesel Demand

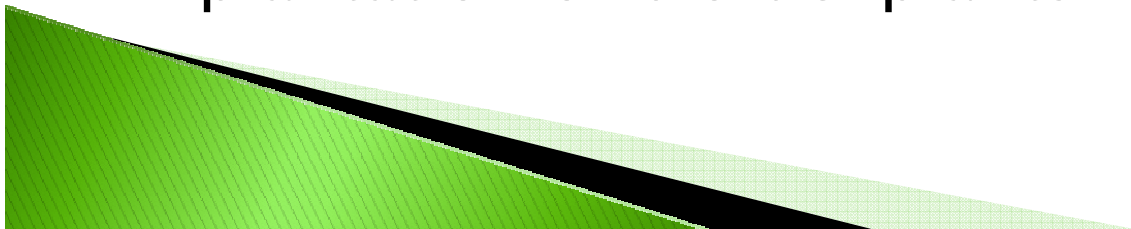
No	Description	Unit	Year				Remark
			2011	2012	2013	2014	
1	Required diesel	lit	2,774,990,000	5,044,713,333	5,347,300,000	7,820,000,000	
2	Blending	%	10%	15%	20%	20%	
3	Biodiesel required for blinding	lit	277,499,000	756,707,000	1,069,460,000	1,564,000,000	1L=16E TB
	Saved money from	ETB	4,439,984,000	12,107,312,000	17,111,360,000	25,024,000,000	
	import diesel	USD	261,175,529	712,194,824	1,006,550,588	1,472,000,000	1UDS= 17ETB
Total Saved money due to blinding biodiesel in the next 4 years						3,451,920,941	USD
						58,682,656,000	ETB





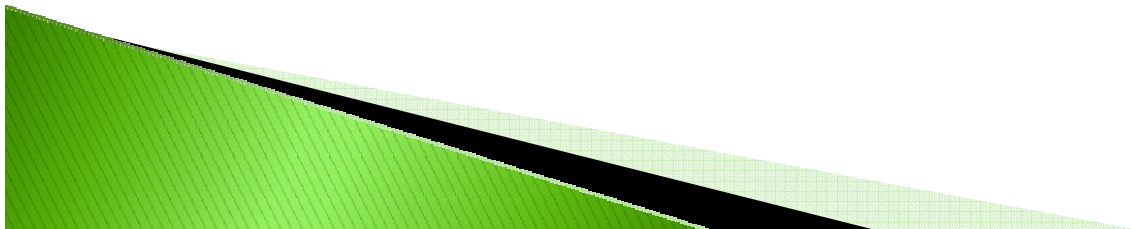
# Steps Done in the country

- ▶ The Government has the bio-fuel development and utilization Strategy plan since 2007
- ▶ 25.4million hector was prepared by the government for investment and the they are promoting the sector for local and international investors.
- ▶ At the all Regional level Bio-fuel steering committee was formed
- ▶ Ethiopian Environmental Protection Authority and Water and Energy Minister promoting the plantation of biofuel plants.



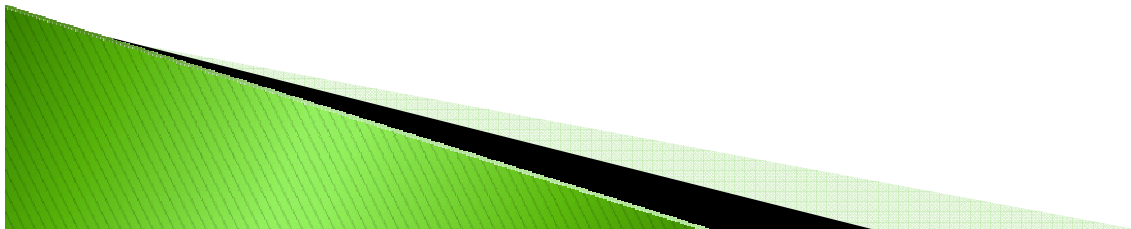
# Ethiopian Jatropha plantation (2007–2012)

- ▶ Tigray region 11,604,896 plants
- ▶ Amahara region 165,445,960 plants
- ▶ SNNP region 4,000,000 plants (not-intentionally planted)
- ▶ Current Total biodiesel production potential is 90 million liter per annum.

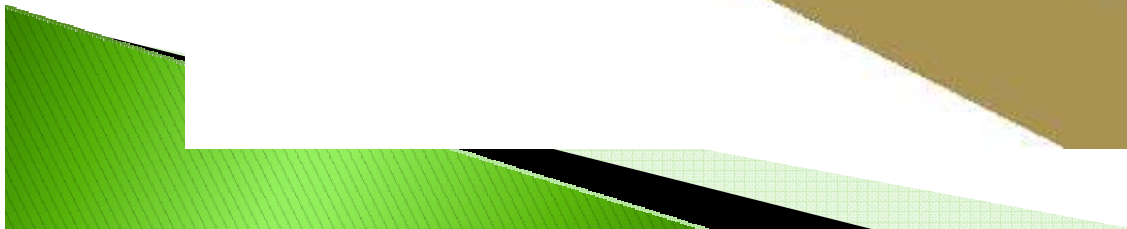
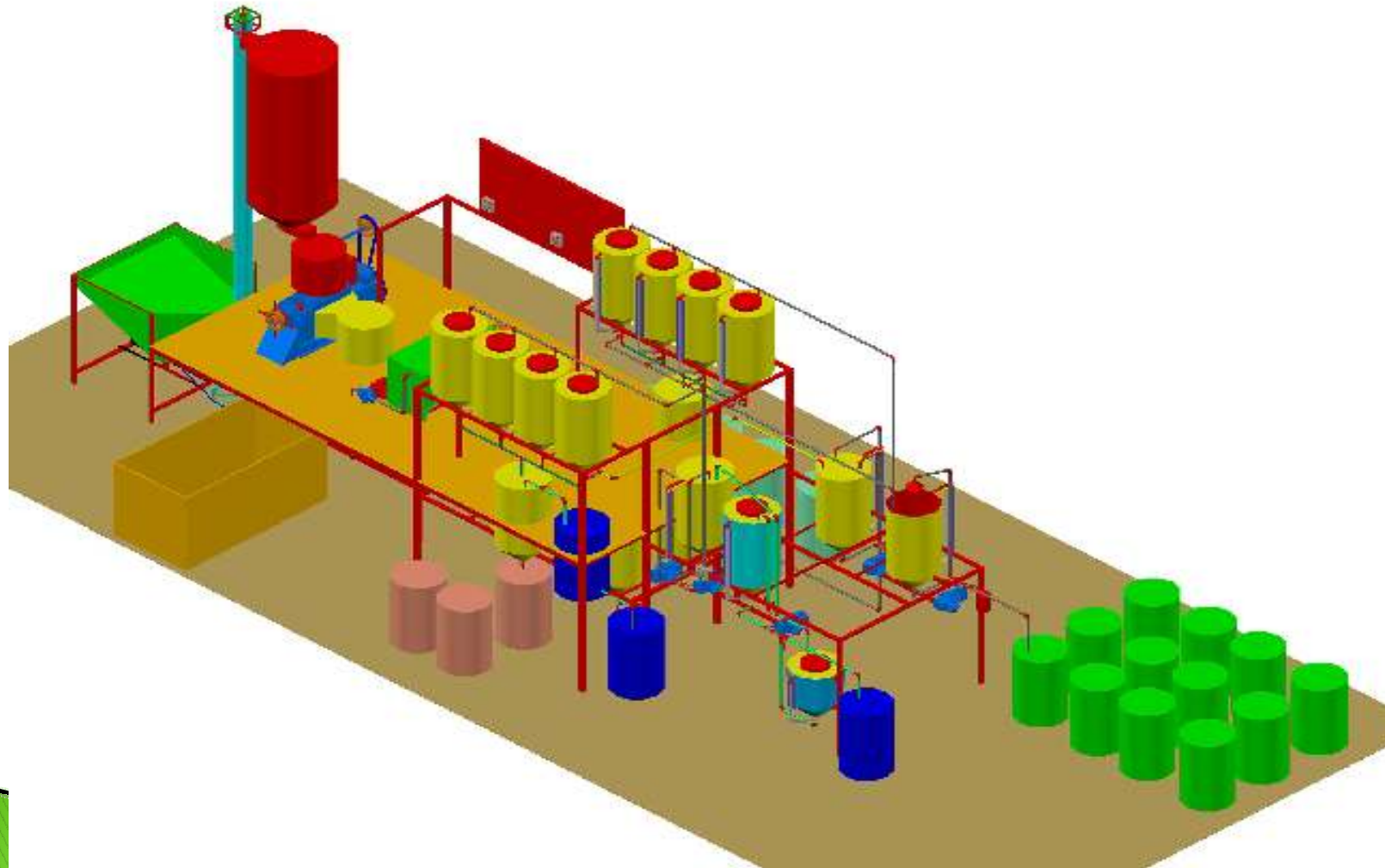


# So What is the Gap?

- ▶ No biodiesel processing technology in Ethiopia.



# 1<sup>st</sup> Biodiesel processing Machine Design



# 1<sup>st</sup> Biodiesel Machine, Hawassa, Ethiopia

ME



Capacity of 300,000lit/year



# 2<sup>nd</sup> Biodiesel Factory on Bati, Ethiopia





# Inauguration of Pilot project biodiesel factory (2<sup>nd</sup> machine)

- ▶ 300lit/day capacity



# Biodiesel Factory main raw material

- ▶ Any non-edible oil plants
- ▶ Currently available raw material in Ethiopia

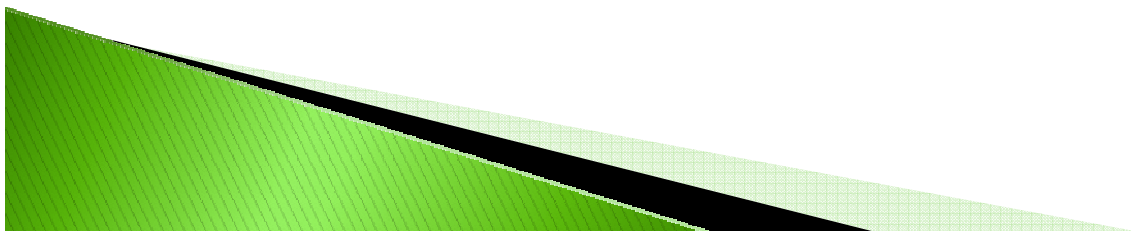


**Castor bean**

**Jatropha curcase**

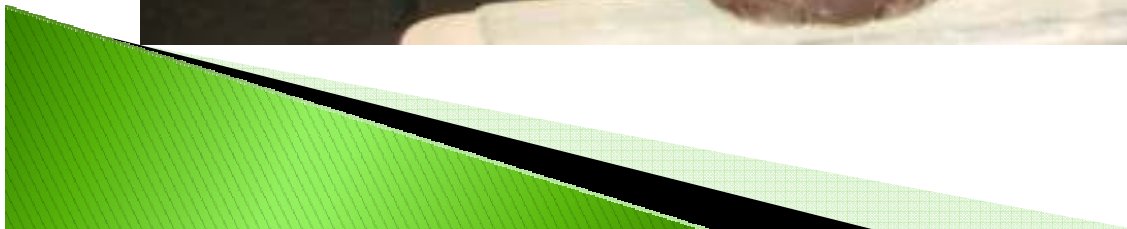
# Biodiesel Factory final products

- ▶ Biodiesel
- ▶ CBG
- ▶ Organic fertilizer
- ▶ Glycerin





# Jatropha oil

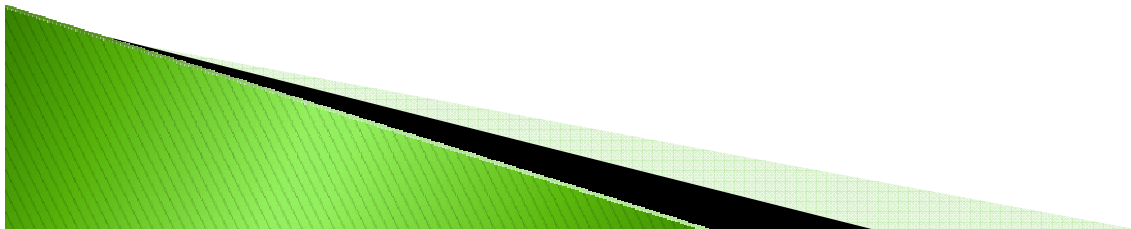


# 1. Biodiesel–Green Energy

- ▶ physical and chemical properties similar to petroleum diesel and can be used in existing diesel applications with little or no modification to the engine or fueling system.
- ▶ it significantly reduces greenhouse gas (GHG) emissions
  - CO<sub>2</sub>, methane, and NO<sub>x</sub> are reduced by 70%,
  - “Net effect Zero ” due to production cycle
- ▶ Reduces tailpipe Particulate matter(PM), hydrocarbon (HC), and carbon monoxide (CO) emissions.
- ▶ Improves fuel lubricity and raises the CN of the fuel.
- ▶ Best solution for World Fossil fuel scarcity conflict and price rushing



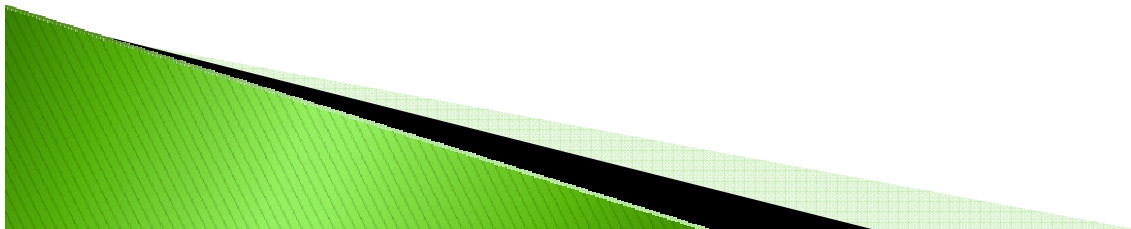
- ▶ Less Energy Density
  - Biodiesel contains 8% less energy per gallon.
- ▶ Low-Temperature Operability
  - biodiesel's freeze point may be  $-6^{\circ}$  to  $-1^{\circ}\text{C}$  higher than that of petroleum diesel.
  - To accommodate biodiesel in cold climates, low cloud point petroleum diesel or low-temperature flow additives, or both, are necessary.
- ▶ Storage Stability
  - If the fuel will be stored for more than a few months, a stability additive is recommended, and acidity should be measured monthly.





## 2. Crude Glycerin

- ▶ It is one byproduct of biodiesel production
- ▶ Require Purification
- ▶ Used in cosmetics and pharmaceutical industry



# 3. Biogas and Bio-fertilizer

They are by-products of biodiesel production

Organic fertilizer

S.No.	Plants	N	P	K
1.	Jatropha curcas	3.2-4.44	1.4-2.09	1.2-1.18
2.	Neem cake	4.85-5.0	0.36-1.00	1.03-1.5
3.	Castor cake	4.82	0.35	1.11
4.	Mahua cake	3.5	-	-
5.	Cow dung manure	0.97	0.69	1.66
6.	Poultry Manure	3.1	6.0	2.11

500 m<sup>3</sup> biogas per ton can be produced



# AWARDS AND RECOGNITIONS



# National patent

from Ethiopian Intellectual property office, Addis Ababa



**በሳይንስና ቴክኖሎጂ ሚኒስቴር**  
**የኢትዮጵያ ስነምግባር ጥናት ህ/ቤት**  
**Ministry of Science and Technology**  
**Ethiopian Intellectual Property Office**



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**የግንባታ ህጋዊ ምስክር ወረቀት**

በፈጠራ አካላትና ፈጠራና ኢንዱስትሪያዊ ንድፍ አዋጅ ቁጥር 123/1987 አንቀጽ 42 መሠረት፡

የምዝገባ ቀን፡ 04/01/2011  
 የማመልከቻ ቁጥር፡ ET/UM/2011/828

በሆነ ማመልከቻ ለተገለፀና ርዕሱ ከጃትሮፋና ጉሎ ፍሬዎች ባዩ-ዲዝል የአመራረት ሂደት እና የማምረቻ መሣሪያ ለሆነ አካላት የፈጠራ ሥራ ቁጥር 319 የሆነ የግልጋሎት ምስክር ወረቀት ሰኔ 13 ቀን 2003 ዓ.ም.

ለ፡ አ.ንጂነር እሸቱ ደሳለኝ፣  
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አብዱራሣቅ ዑመር  
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 ቴክኖሎጂ ሽግግር ጊ/ዳይሬክተር

**UTILITY MODEL CERTIFICATE**

In accordance with Article 42 of the Proclamation Concerning Inventions, Minor Inventions and Industrial Designs, No. 123/1995 it is hereby certified that a Utility Model Certificate Number 319 has been granted to:

**Engineer Eshetu Dessalegn (Whose Legal Address is P.O. Box: 188, Hawassa)**

On 20 June 2011 in respect of a minor invention disclosed in:

Application Number: ET/UM/2011/828  
 Filing Date: 04/01/2011

**Being a Minor Invention Entitled:** Methods & Apparatus of Producing Bio-diesel From *Jatropha curcas* and *Castor bean* Seed

Abdulrezak Oumer  
 A/Director of Intellectual Property Protection and Technology Transfer






# NATIONAL AWARD



- ▶ “2007 National Innovation Award” Gold Winner from Ethiopian President
- ▶ “2012 National innovation Award” Gold Winner from The New Ethiopian Prime Minister.

# YOUNG HERO OF DEVELOPMENT AWARD





# WIPO AWARD FOR INNOVATIVE ENTERPRISE



► In recognition on innovative and successful contribution to the biodiesel technology in Ethiopia



# Who Encourage and Support the project

- ▶ 1. Ethiopian Intellectual Property office (with WIPO)
- ▶ 2. Ethiopian Environmental protection Authority (with UNDP)
- ▶ 2. Ethiopian Water and Energy Minister
- ▶ 4. Southern Regional Government

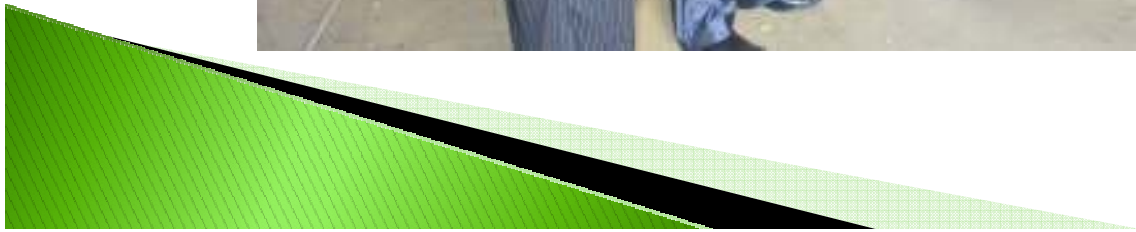


# Higher Officials Visit of biodiesel machine

Ethiopian biofuel director

Ethiopian Water and Energy Minister

Representative of southern Regional government





## Higher Officials Viste



# YME office and lab. at Hawassa, Ethiopia



Thank

You!

Thank

You!

Thank

You!