VÄRME- OCH KRAFTFÖRENINGEN PANNDAGARNA 2013

FRAMTIDA BRÄNSLEN – *NÅGRA FUNDERINGAR*

Allmänna funderingar

Lennart Ryk **vice Vd EFO AB**

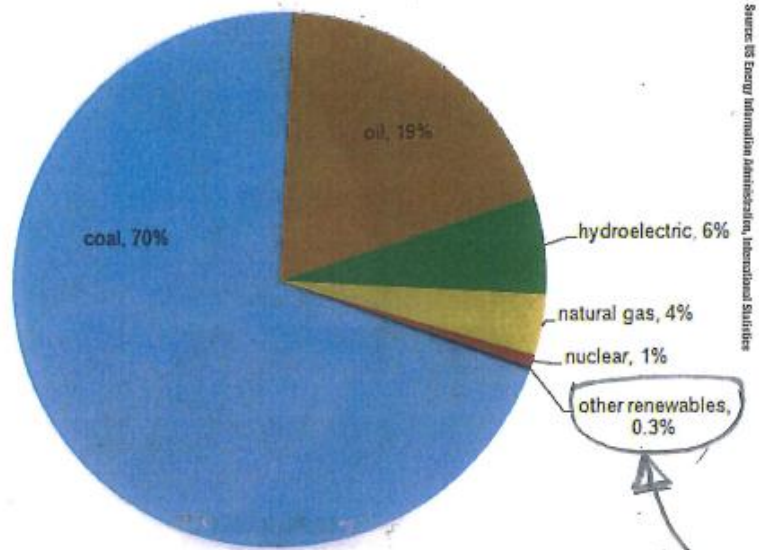
Träpellets och torrifierade bränslen

Sammy Öhrling **inköpare EFO AB**

BIOBRÄNSLEN: SKOGSFLIS, TRÄPELLETS,RUNDVED, STYCKETORV, TORVBRIKETTER
TALLBECK, BIOOLJOR
AVFALLSBRÄNSLEN: RETURFLIS, RDF, GUMMI, AVFALL
FOSSILA BRÄNSLEN: STENKOL, OLJA

Ca 1,5 – 1,7 milj ton/år

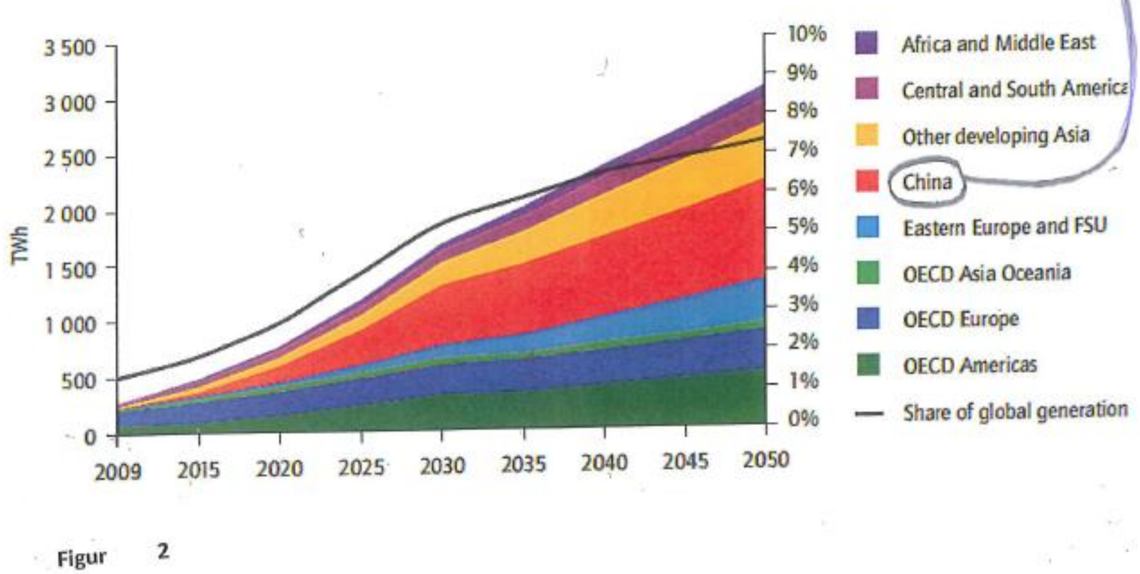
China's installed electricity capacity by fuel, 2011



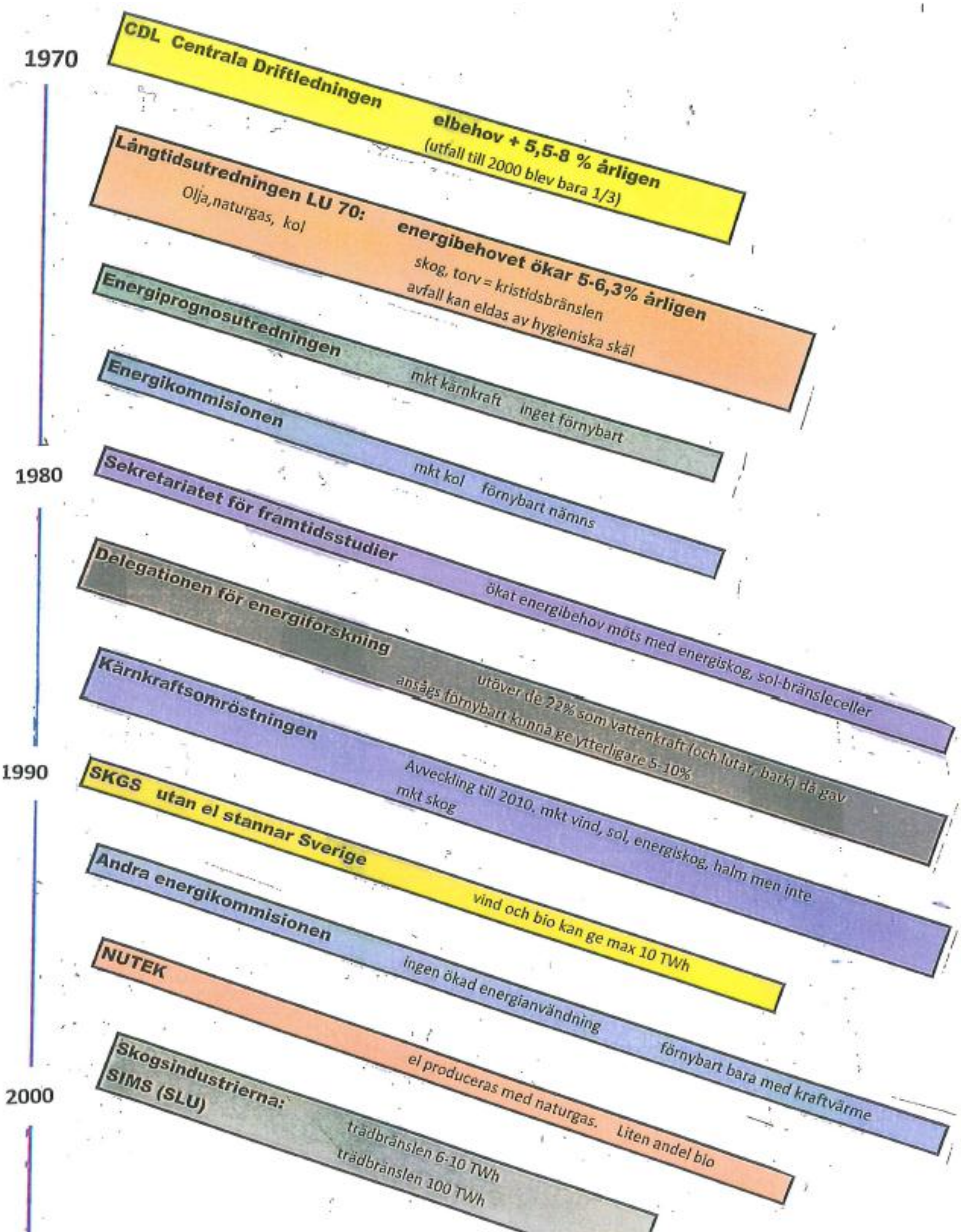
Figur 1

International Energy Agency

World bioenergy electricity supply to grow more then ten-fold

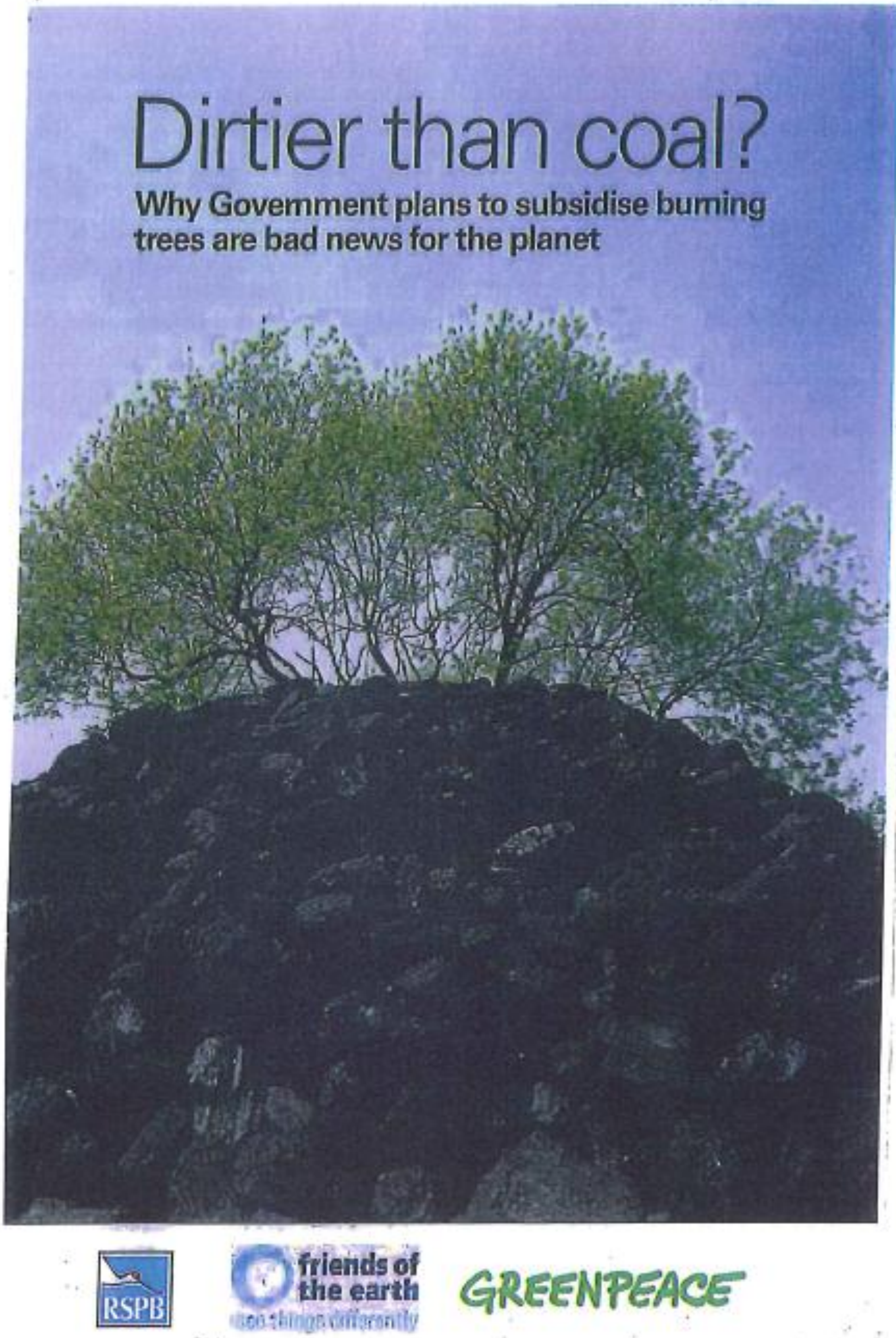


Figur 2



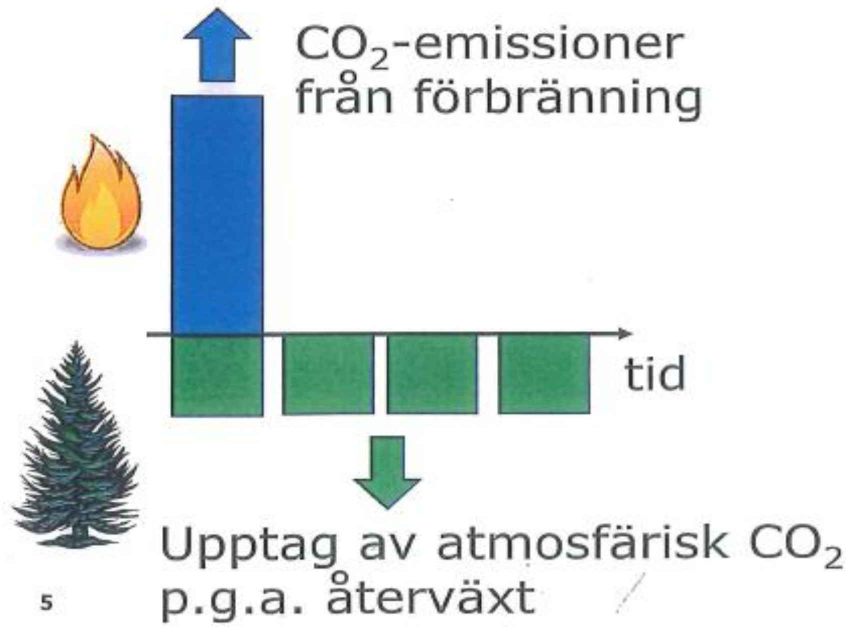
Figur 3 **Exempel på vad några framtidsstuier sagt om energi och bränslen**

(Detaljerat beskrivet i kommande rapport från KSLAs Energikommittee)


Dirtier than coal?
Why Government plans to subsidise burning trees are bad news for the planet
RSPB
friends of the earth
GREENPEACE

Figur 4

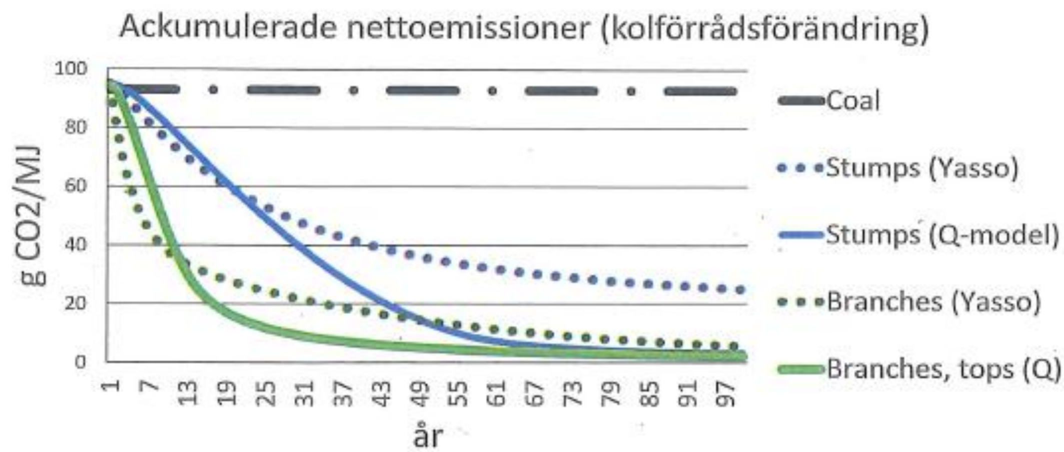
Är biobränslen klimatneutrala?



Figur 5

Lars Zetterberg SVEBIO-dagarna i Kolmården 2012

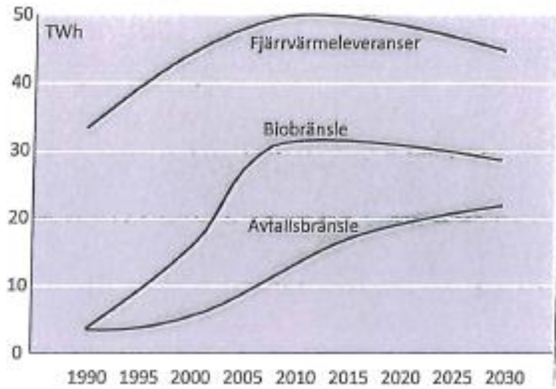
Jämförelse GROT, stubbar och kol



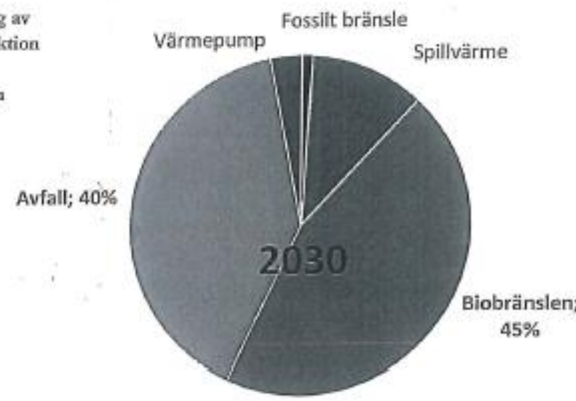
g CO_2/MJ bränsle	**20 år**	**100 år**
Kol	93	93
Naturgas	56	56
GROT	**15-27**	**2-5**
Stubbar	**57-58**	**3-25**

Figur 6

Utvecklingen för bio- och avfallsbränslen



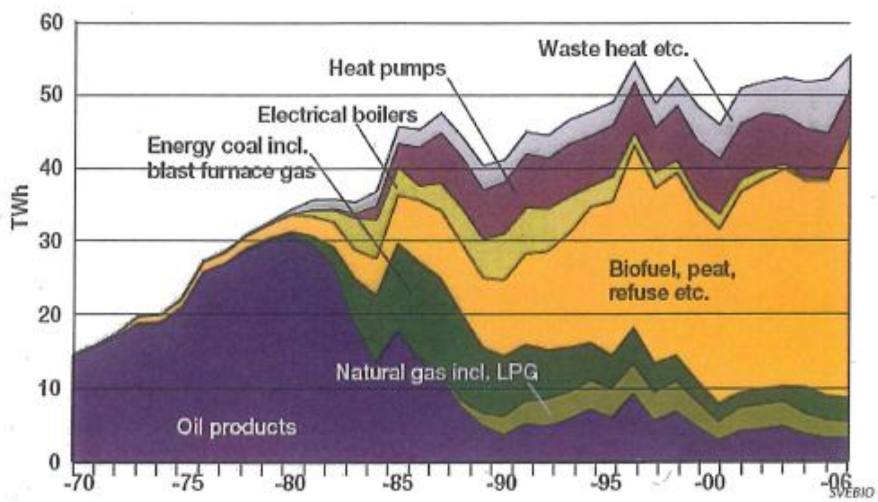
Prognoser för värmeleveranser samt användning av bio- och avfallsbränslen för värme- och elproduktion i svenska fjärrvärmesystem
Källa: Analyser av Profu i energisystemmodellen MARKAL-Nordic



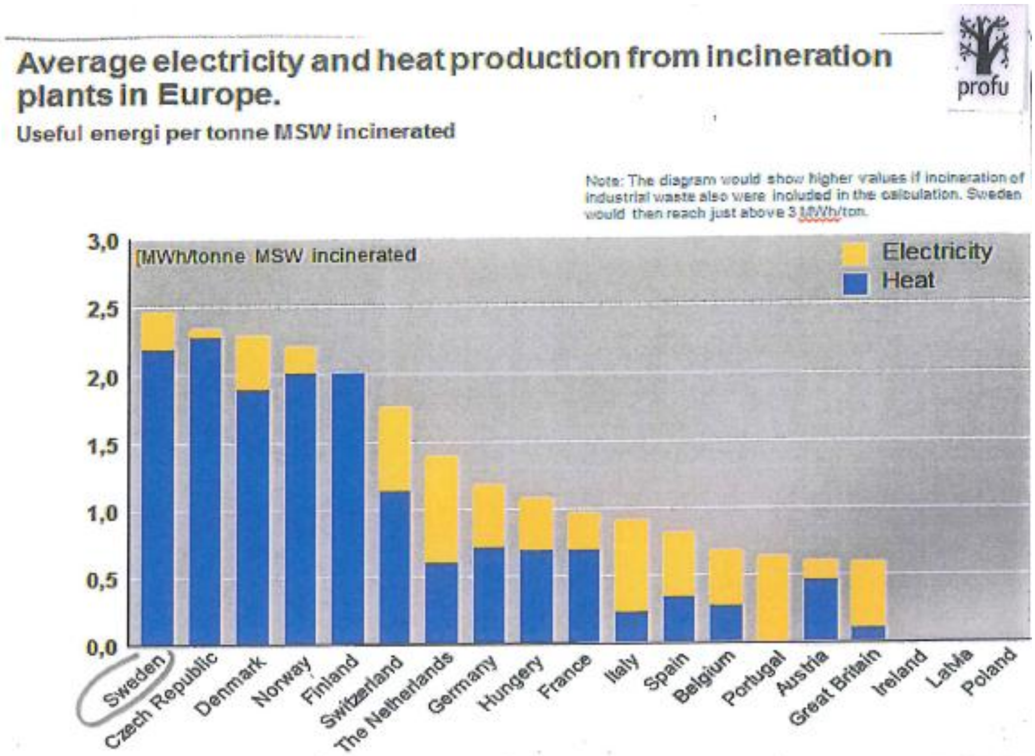
Figur 7

Insatt bränsle för värme- och elproduktion i svenska fjärrvärmesystem år 2030
Källa: Analyser av Profu i energisystemmodellen MARKAL-Nordic

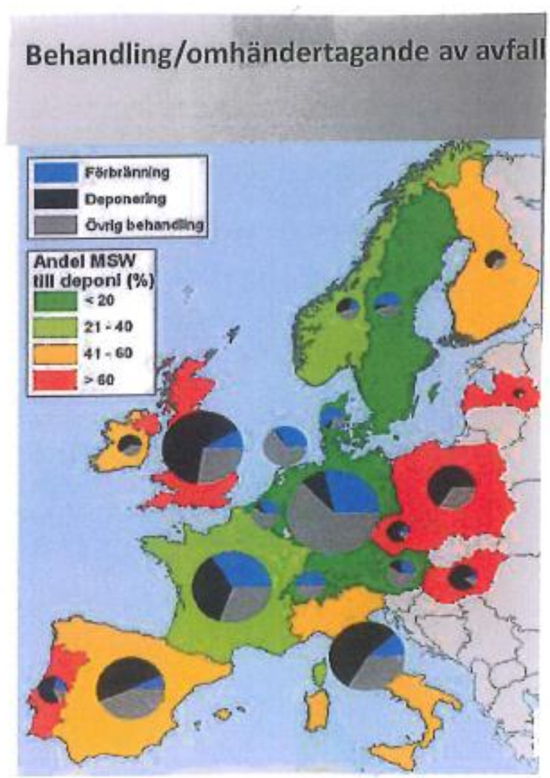
Biofuels dominate in district heating



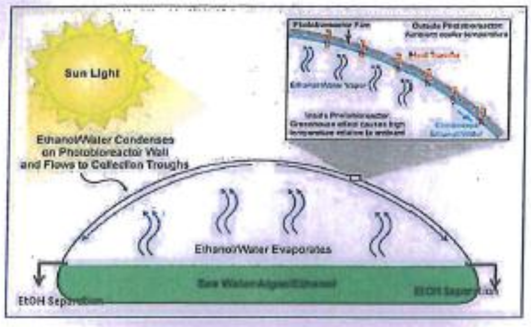
Figur 8



Figur 9



Figur 10



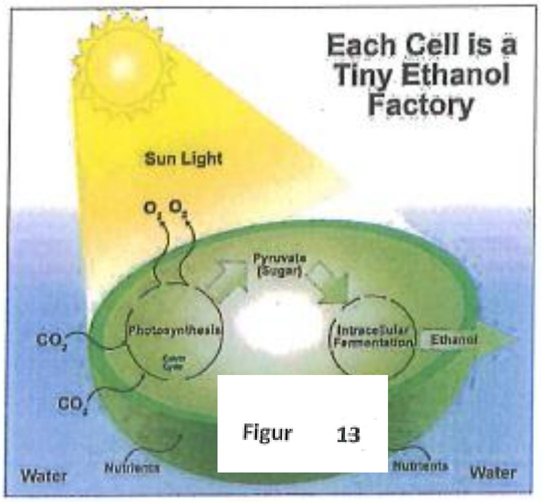
Our DIRECT TO ETHANOL® process incorporates a proprietary Vapor Compression Steam Stripping (VCSS) technology that allows for energy-efficient concentration of ethanol. Other downstream separation technologies such as distillation or membranes are employed to upgrade the ethanol for use as a transportation fuel. These technologies in combination with the solar-powered separation in our patented photobioreactors yield ethanol from the DIRECT TO ETHANOL® process with a carbon footprint that is 80% less than that of gasoline.

Figur 11

DIRECT TO ETHANOL® TECHNOLOGY

ALGENOL'S CARBON PLATFORM MODULAR TECHNOLOGY

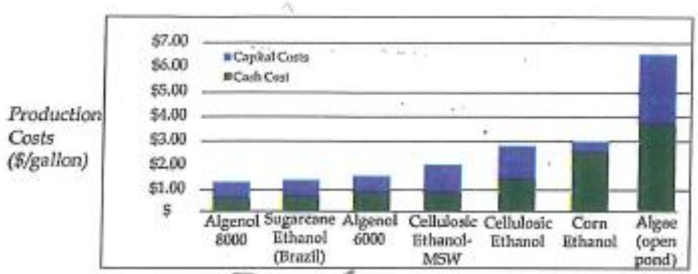
The DIRECT TO ETHANOL® process uses sunlight, algae and carbon dioxide to produce ethanol. Our patented technology employs enhanced blue-green algae (or cyanobacteria) to convert sugar (pyruvate) made from carbon dioxide and saltwater by photosynthesis into ethanol.



Figur 13

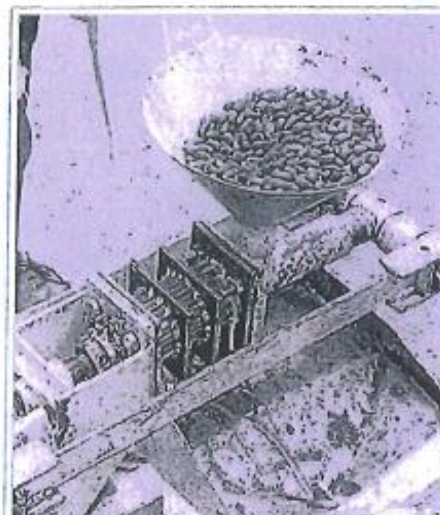
Cyanobacteria are among the most photosynthetically active organisms on Earth,and are therefore very good at fixing carbon. Algenol enhances cyanobacteria's natural ability to produce ethanol by over expressing fermentation pathway enzymes allowing each cell to channel carbon into ethanol production. Algenol has approximately 2,300 algae strains that have been collected globally, characterized and screened. We are working actively to produce more enhanced strains optimized for increased ethanol production and other commercial performance characteristics.

Figur 12



Figur 13

Toppen på en Jatropha-buske med de oljerika fröna



Oljepress med Jatropha-frön

Figur 14