

Bioenergy sustainability - WWF'S PERSPECTIVE -

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Content





Internal context WWF's climate solutions

Main conclusions:

- WWF sees climate change as a major threat to biodiversity that will potentially overshadow any other human-induced threat.
- High degree of probability that known forms of sustainable energy sources using known technologies can be harnessed to meet doubling energy demands by 2050.
- Achieve 60-80% reduction of climate dangerous emissions
- Long term stabilization of 400 ppm, which will hopefully avoid dangerous climate change and keep warming under 2 C⁰

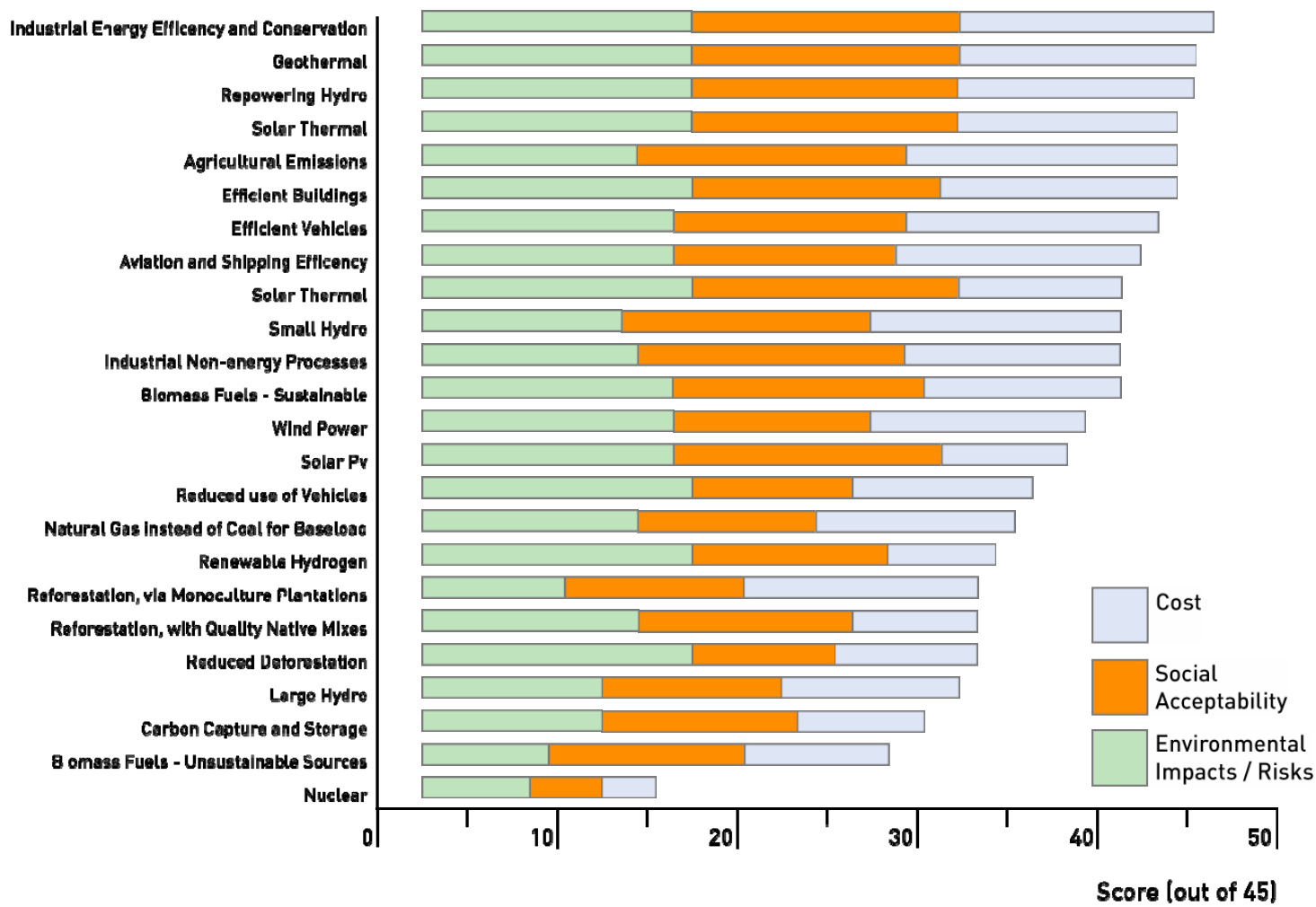




- 6 solutions, one of them is the wide use of renewable sources of energy
- Bioenergy for heat and transport holds vast potential but could go terribly wrong if implemented unsustainably – *e.g.*, by clearing biodiverse habitats to plant energy crops.
- **By 2050, the scenario includes the equivalent range of 110-250EJ per year from sustainable biomass, with a best estimate at 180EJ/yr. Together, this and other low emission technologies can provide 513EJ energy per year by 2050, or about 70% of the supply after efficiencies have been applied.**

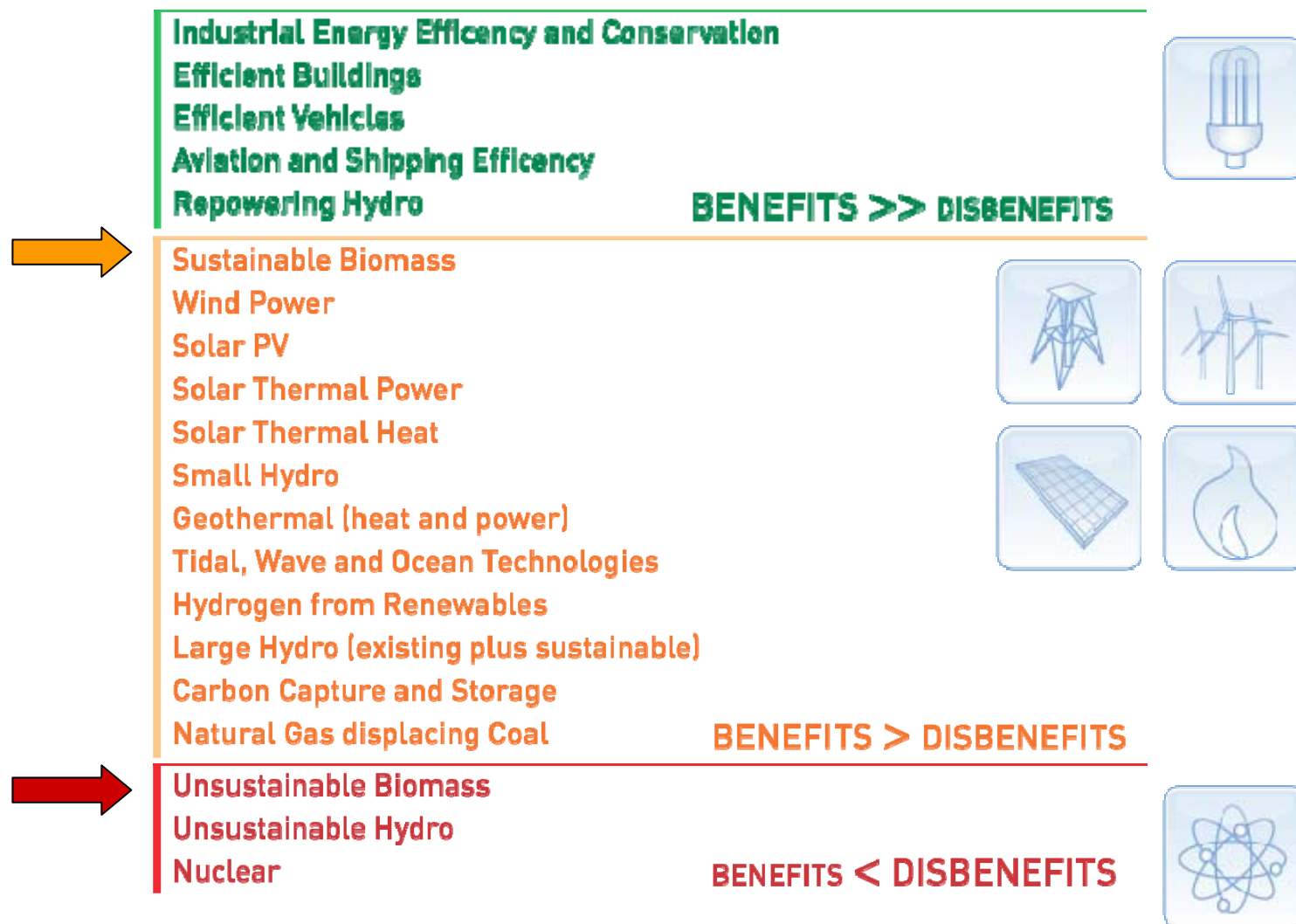


Ranking of low- and zero-carbon "technologies" using: environmental impact/risks, social acceptability, and cost criteria.





WWF Grouping of „technologies”





External context

- Various drivers for bioenergy (climate change, rural development, energy security)
- Fast growth: Bioenergy targets in > 50 countries worldwide
- Several intensive debates:
 - Agriculture subsidies, tariffs, free trade agreements...
 - Expansion of “sensitive” Commodities (palm oil, soy...)
- Globally around 46 EJ of bioenergy (IEA, 2006)
- **Traditional solid biomass (fuelwood, dung, charcoal, straw...): 35 EJ and over 1/2 of global wood consumption!**



Context

Potential impacts and opportunities

Tools for a sustainable bioenergy sector

Conclusions and recommendations





Potential impacts

**Intensification of agriculture and
forestry on currently used land
AND conversion of highly diverse
ecosystem to increase production
capacity!**





Potential impacts in forestry...

Increased harvest of woody biomass in commercial forests

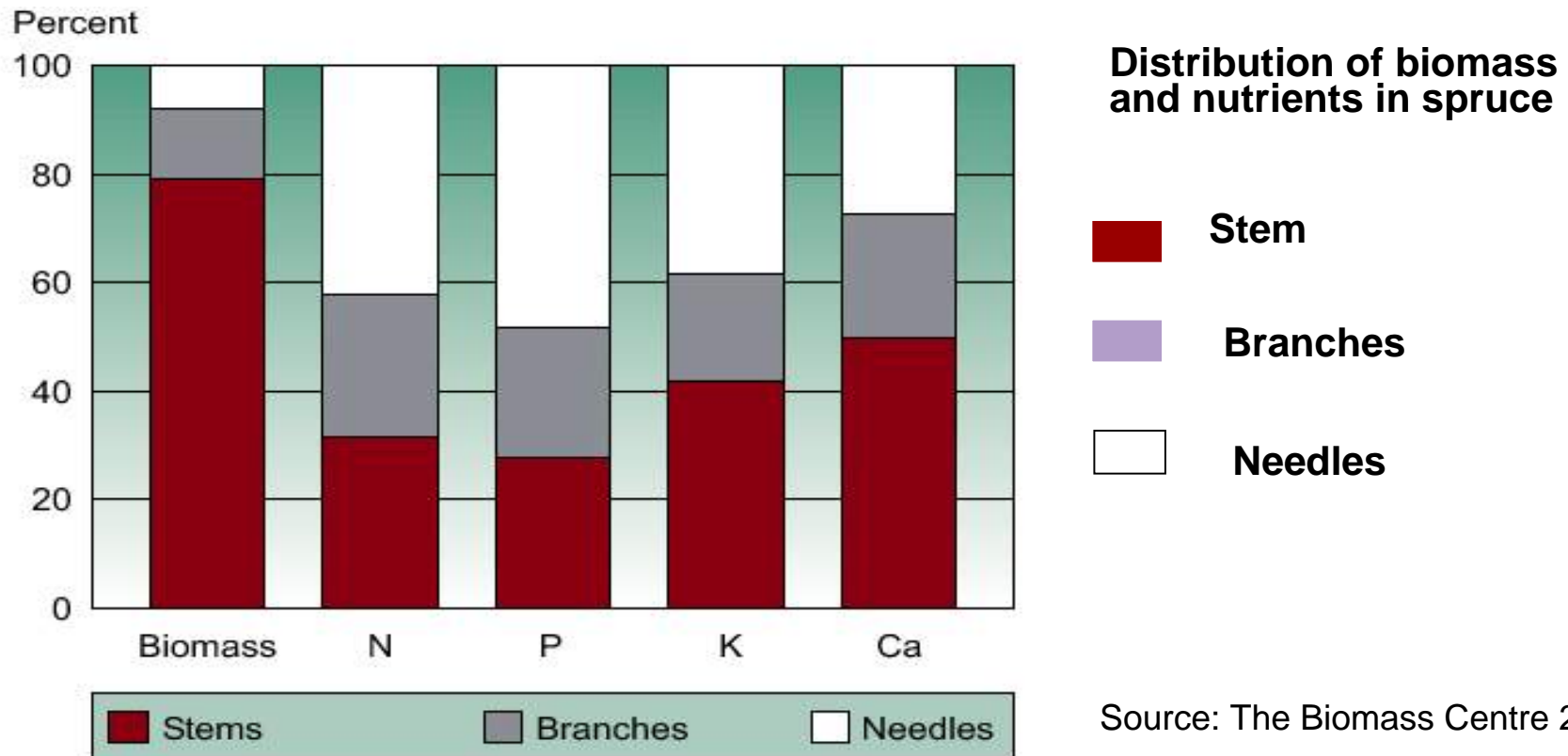
- increased use of annual increment (in forests with high utilisation rate): in most of the large forest holdings the use of annual increment is high (70-80%), while in forest owned by small private owners utilization rate is much lower (45-50%).

further decreasing quantities of deadwood. A WWF report published in 2004 states that temperate forests need at least 20-30 m³/ha of deadwood. 1/3 of the species living in temperate forests depend on deadwood.

- increased pressure on protected and protective forests.



- *increased harvest of woody biomass (up to whole tree harvesting, including roots and stumps)* which can lead to nutrient scarcity, disturbance due to increased transport.





- **short rotation forestry and coppice:**

Where? Not on diverse grasslands, or close to wetlands.

What? Not invasive species (*Eucalyptus* sp., *Robinia pseudacacia*), not hybrid poplars close to genetically „pure” black locust (*Populus nigra*)

How? In principle the impacts are positive if proper safeguards and best management practices are used.



More environmental threats from agriculture...

- Habitat loss—55% and counting
- Water take—70% of human use,
- Loss of soil—half of topsoil lost globally;
- 70-90% of farmers loose more carbon/year than put back
- Agro-chemicals—more used in agriculture than any other industry
- Pollution—more than any other human activity
- Climate change—25-40% of greenhouse gases that contribute to climate change





Soil erosion







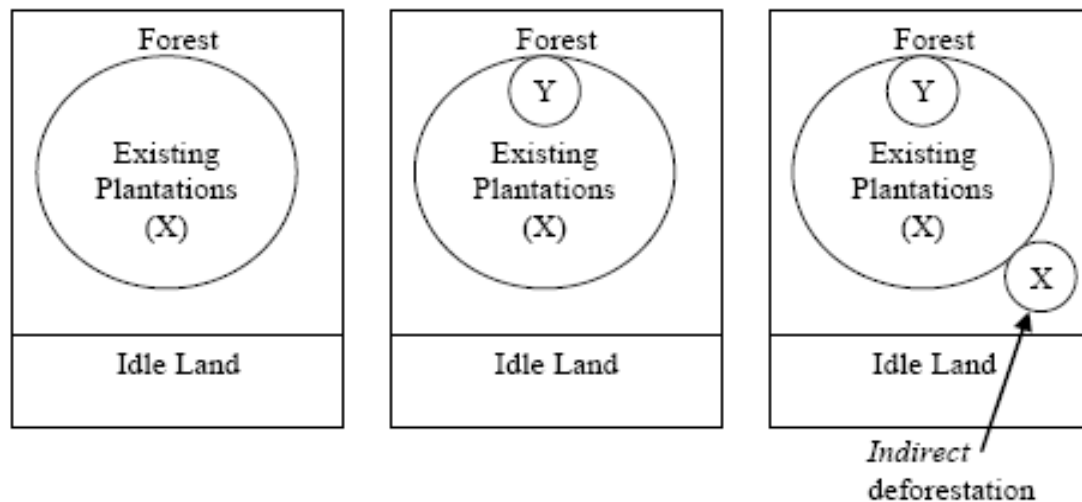
Wrong management





Displacement, food security

- Bioenergy feedstock production replacing other land-uses which then drive conversion. Demand on the market for the displaced feedstocks will not disappear. Addressing displacement is a very complicated issue because it acts across borders and crops.



Source: Ecofys



Positive impacts include

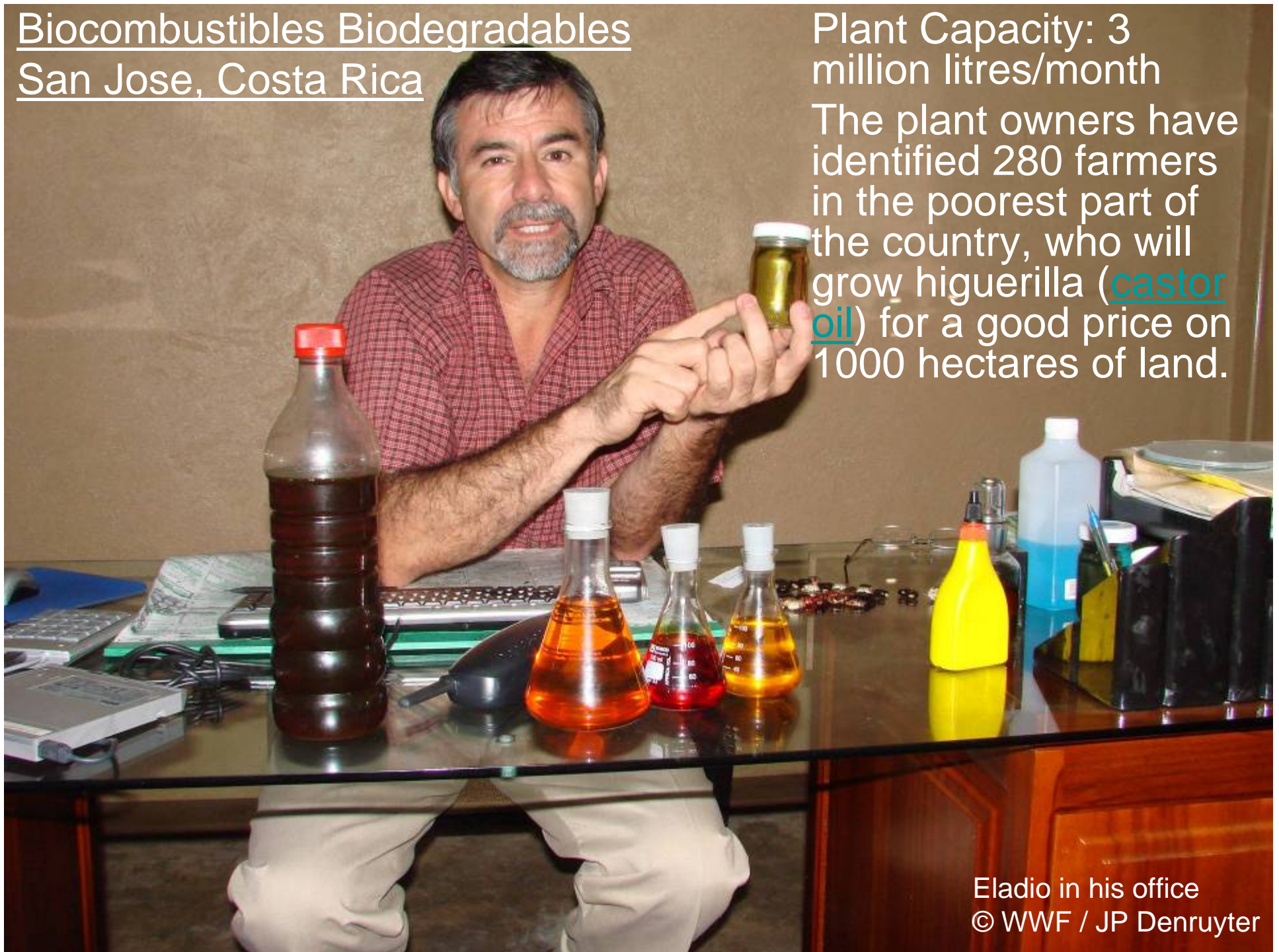
- GHG savings - For WWF, GHG emissions reduction is the primary reason for investigating bioenergy potentials
- Contribution to employment & renewable energy strategies
- Rural Development
- Replacing inefficient biomass with modern bioenergy



Biocombustibles Biodegradables
San Jose, Costa Rica

Plant Capacity: 3
million litres/month

The plant owners have
identified 280 farmers
in the poorest part of
the country, who will
grow higuerilla ([castor
oil](#)) for a good price on
1000 hectares of land.



Eladio in his office
© WWF / JP Denruyter





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Potential impacts and opportunities





Existing tools

- Protected areas, environmental & social legislation, land use planning...
- Voluntary Commodity Initiatives such as: FSC, RSPO, RTRS & Basel Criteria, BSI... are established or under development
- GHG calculation not required, as the initiatives were not developed for bioenergy
- Good start but not sufficient to ensure a sustainable development of bioenergy: we need a system that is suitable for bioenergy.



A Global Solution?

- Ask for global legislation? Difficult, long process
- Ask for national legislation? Possible, but risk of conflicts in case of international trade
- Ask for global standards combined with regional/national legislation. Route chosen by WWF:
 - Forestry Stewardship Council –FSC
 - Roundtable on Sustainable Palm Oil –RSPO
 - Roundtable on Responsible Soy –RTRS
 - Better Sugarcane Initiative –BSI
 - Roundtable on Sustainable Biofuels -RSB



Bioenergy Sustainability Assurance

- **Sustainability of bioenergy = sustainability of agriculture & forestry management + GHG performances + social performance**
- **In WWF's view there is no justification for bioenergy which is not delivering SIGNIFICANT GHG reductions and its produced in a responsible manner.**

Minimize environmental and social impacts maximise benefits!

- **No conversion of high conservation value areas (HCVAs): forests, permanent grasslands, floodplains etc.**
- **Responsible use of water and soil resources**
- **Protection of biological diversity**



International Meta-Standard Strategy

- There is a need for an internationally agreed production standard covering all kind of crops
- The standard should not be used for protectionist purposes and should NOT disadvantage small producers.
- Should ensure legality and environmental and social sustainability



The EU biofuel directive

- The biofuel sustainability scheme is still under development, however:
 - Will define „no-go” areas (wetlands, grasslands, forests), based on biodiversity and carbon criteria
 - Will probably promote production on idle/degraded lands or waste products
 - Promote better management farming practices
 - Will hopefully link incentives to GHG performances and will define minimum GHG savings (45% by 2013, 60% by 2015)
 - Will define social safeguards (reporting)



Additional measures are needed to reduce indirect impacts

- Support production of bioenergy based on waste products, improve efficiency in existing systems (Indonesia could significantly increase its production of palm oil by implementing better management practices) and promote production on idle / degraded land





Production on degraded and idle land

- Is of relatively high importance for the sustainable jatropha production
- There is no agreed definition or methodology
- A lot of confusion around the 2 terms
- Incomplete set of criteria used to identify these land categories
- WWF is working with corporate and non-governmental stakeholders to develop a credible methodology based on the High Conservation Value Framework



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Conclusions/reccomendations

- Bioenergy can have a significant contribution to climate change mitigation, rural development etc. but it can also go terribly wrong.
- The additional land demand for biofuels is small compared to the total use of land for agriculture but it will be 30-70% of the additional land requirement between now and 2050. It is a significant driver of future land use change. (UK Gov, Gallagher Review)
- So called low productivity forests, bare mountains and marginal land may include areas with high conservation value!
- Some of WWF's global 200 ecoregions are concerned by planned large-scale bioenergy plantations.



Conclusions/reccomendations

- Strengthen stakeholder participation in land use planning and bioenergy plantation development.
- Advocate for environmental and social standards for the establishment of large-scale bioenergy plantations
- Advocate for high conservation value areas (forests and other ecosystems) assessment as the first step in bioenergy plantation planning and designing.
- Monitor ecoregions to prevent negative impacts by the establishment of bioenergy plantations.
- Raise the awareness for the risks of genetically modified trees.



Specific recommendations in the Chinese context

- Strengthen stakeholder participation in land use planning
- Advocate for compulsive environmental and social minimum criteria for the establishment of large-scale bioenergy plantations
- Promote the development of a standard for responsible management of woody bioenergy plantation.
- Promote the development of a sustainable standard for oil tree plantations.
- Advocate for high conservation value areas (forests and other ecosystems) assessment as the first step in bioenergy plantation planning and designing.
- Monitor ecoregions to prevent negative impacts by the establishment of bioenergy plantations.
- Raise the awareness for the risks of genetically modified trees.
- Promote credible forest certification



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Thank you for your attention!

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