

If it is bio it is all good

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Introduction

- ➔ Discussion on the sustainability of renewable transport fuels e.g.,
 - Actual GHG emission reduction potential
 - Indirect land use change
 - Food versus fuel – impact on food prices?
- ➔ Sustainability depend on the actual production chain (raw material, location, efficiency, energy use etc.)
 - > varies for different biofuels and individually
- ➔ Life-cycle perspective needed



EU policy perspective: Current sustainability criteria in the RED

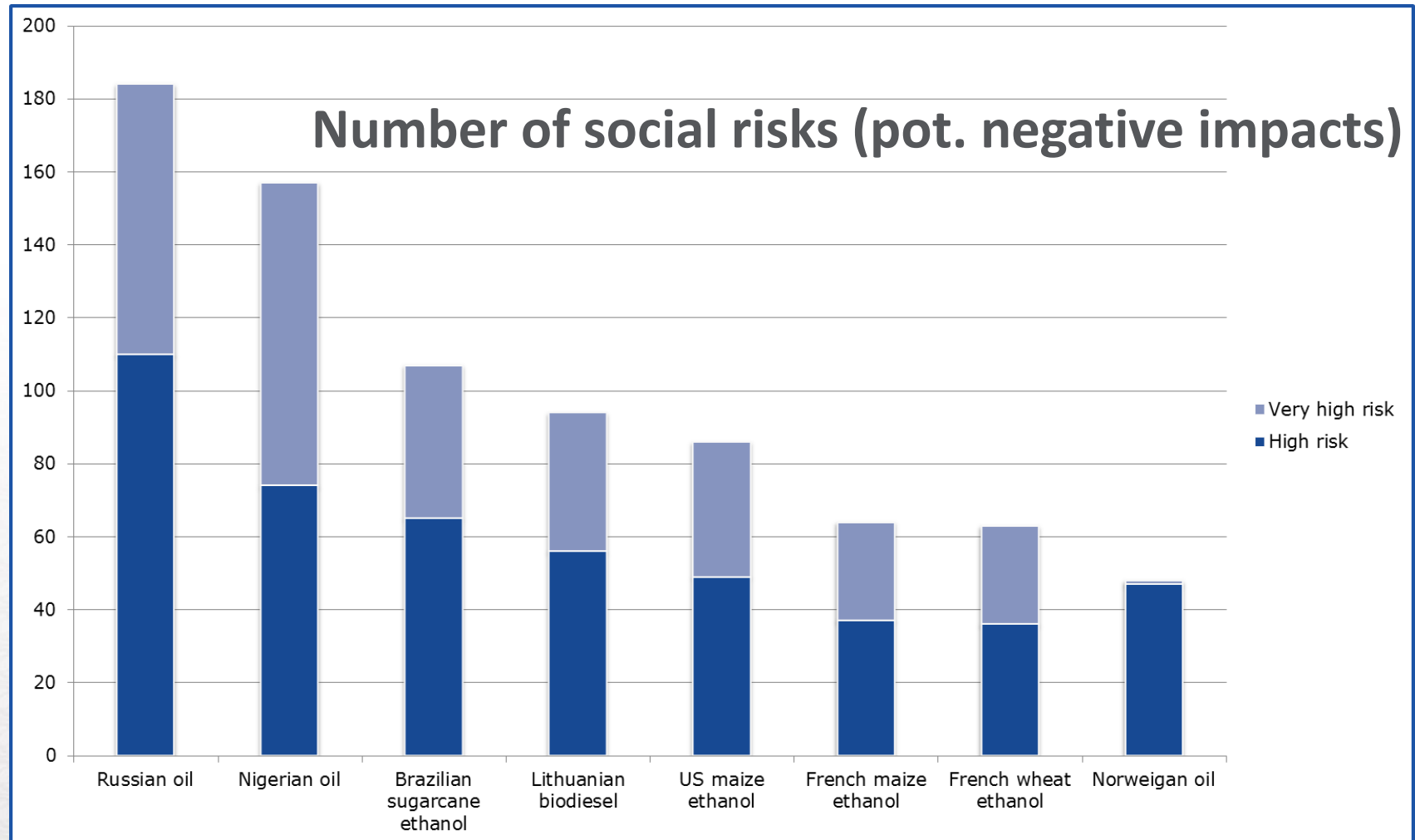
- ➔ GHG emission saving at least 60 % for biofuels production starting after October 5 2015 (50% for other production).
- ➔ Biofuels shall not be made from raw material obtained from
 - land with high biodiversity value
 - land with high carbon stock
 - most peatlands
- Certain feedstocks and fuels “preferred” bio-waste, residues, ligno-cellulosic material etc.



- Focus on environmental impact
 - What about social impacts? E.g., labour related, human rights, governance, health & safety, community for different parts of the biofuel chain



Results - social life cycle assessment (S-LCA) based screening assessment of potential social and socioeconomic impacts of selected vehicle fuels



Findings social/socio-economic impacts

- Large numbers of high or very high potential risks of negative social impacts for certain fossil fuels and biofuels
- S-LCA methodology can enable policymakers to identify where severe social impacts occur in the value chain
- Focus on negative social impacts – How can positive impacts also be considered in S-LCA? See:

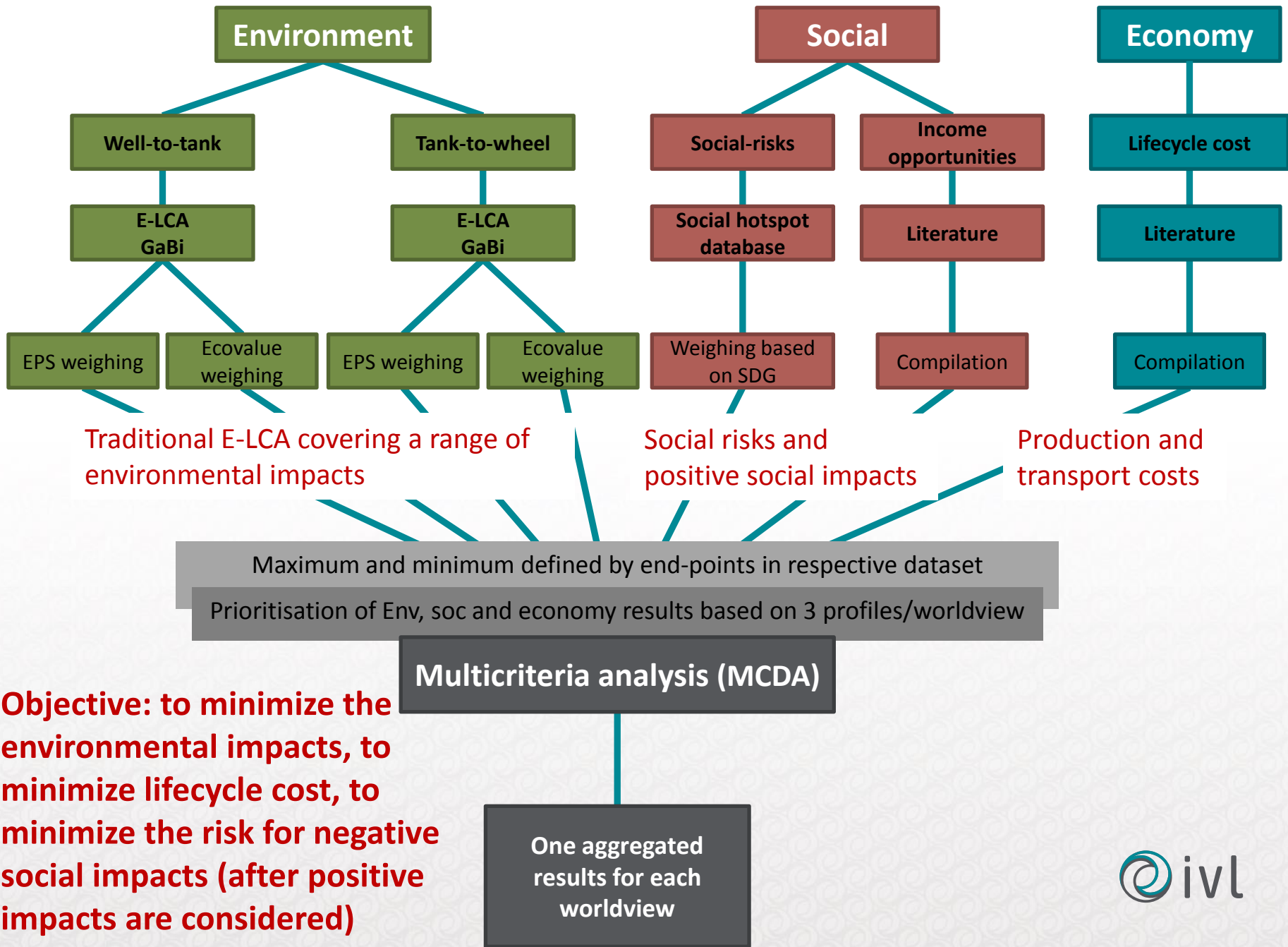
Ekener, E., Hansson, J., Gustavsson, M., 2016. Addressing positive impacts in social LCA – discussing current and new approaches exemplified by the case of vehicle fuels. The International Journal of Life Cycle Assessment, doi: 10.1007/s11367-016-1058-0.

- **If biofuels good or not – consider all sustainability aspects**

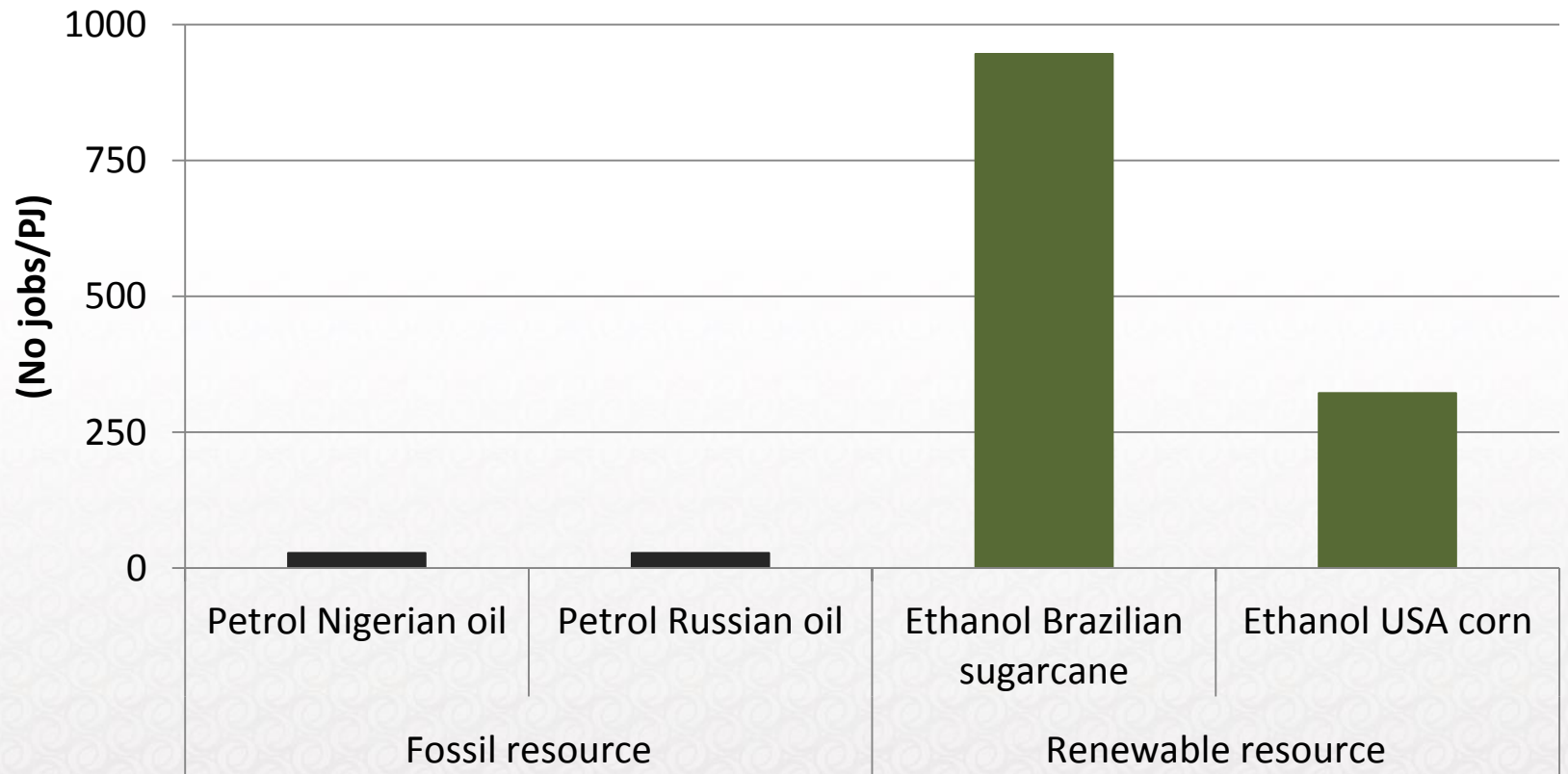


Aim of another study

- Comparative Life Cycle Sustainability Assessment (LCSA) of selected transport fuels considering environmental, social and economic aspects to illustrate sustainability performance
- Approach applied $LCSA = E-LCA + S-LCA + LCC$
- Supply chains considered:
 - Petrol with origin in oil from Nigeria and Russia
 - Ethanol with origin in sugarcane (Brazil) and corn (USA)
- Focus on methodological issues, to test the LCSA approach and resulting policy implications



Positive social impacts exemplified by number of jobs per sector per energy unit produced



Main findings

- ➔ This LCSA method can delineate differences in sustainability performance.
- ➔ The relative ranking of transport fuels differ for the stakeholder profiles tested – representing different priorities between the sustainability perspectives.
- ➔ The LCSA approach entails several challenges but with further improvements it may provide a useful tool for sustainability assessment and policy making.
- ➔ It should be tested for other biofuels with updated comparable data



Main findings

- ➔ Data quality - Production chains may change over time. Challenge to obtain comparable updated environmental impacts. **Result does not represent current situation.**
- ➔ Updated data needed for finding actual sustainability performance
- ➔ How to consider the economic perspective needs to be further explored
- ➔ **Sustainability assessments and criteria complex area that need to be developed further to secure the use of sustainable biofuels**

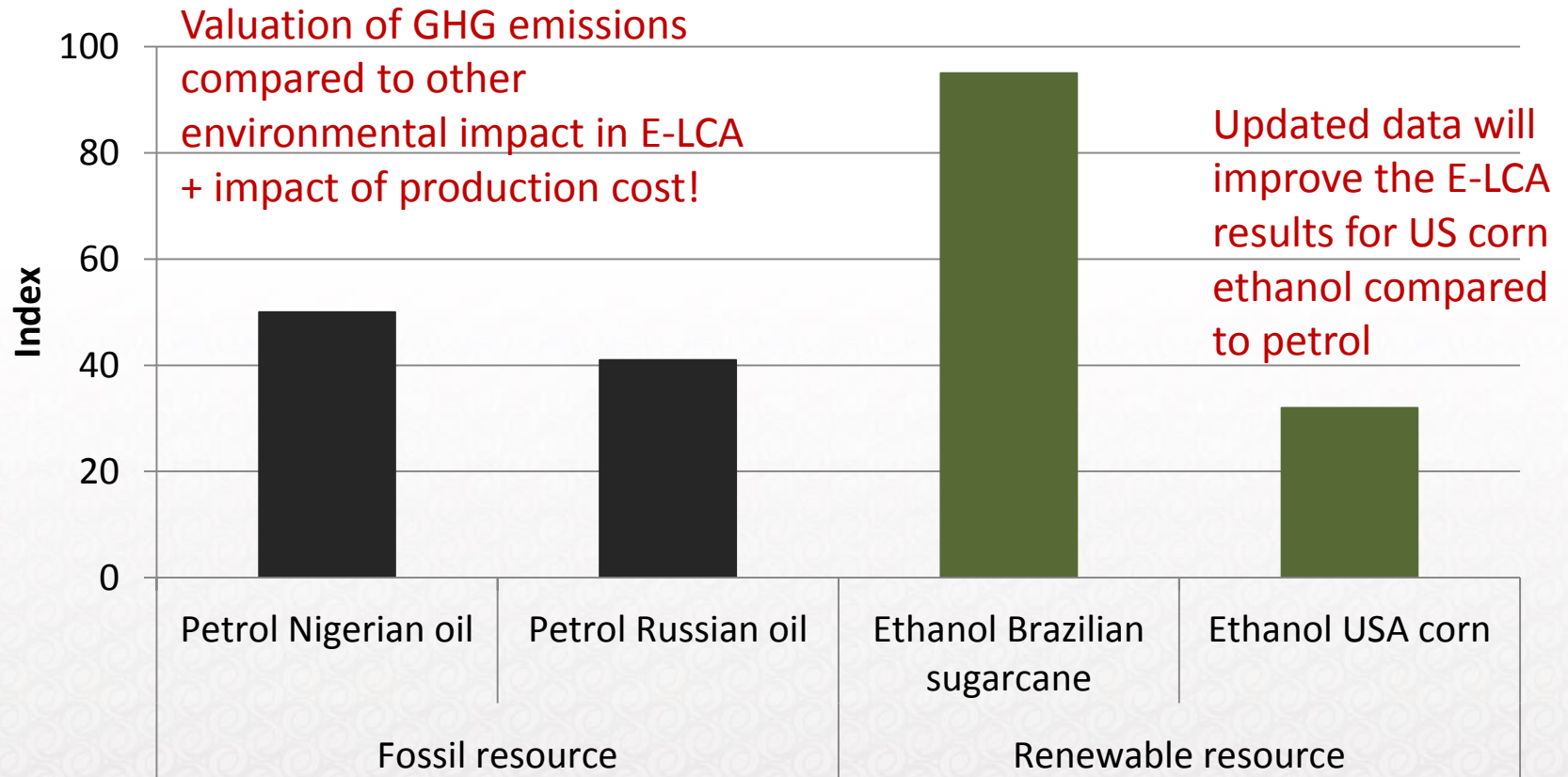
Integration of perspectives – MCDA analysis

- MCDA methods to handle data in different formats, and compare alternatives based on values of decision-maker
- Different priorities of the three sustainability perspectives based on established profiles/world views.

Priority MCDA analysis	Same prio for all parts of LCSA	Egalitarian	Hierachist	Individualist
Prio one (highest)	Same priority – env, social and economic	Social	Environment	Economic
Prio two		Environment	Economic	Environment
Prio three (lowest)		Economic	Social	Social

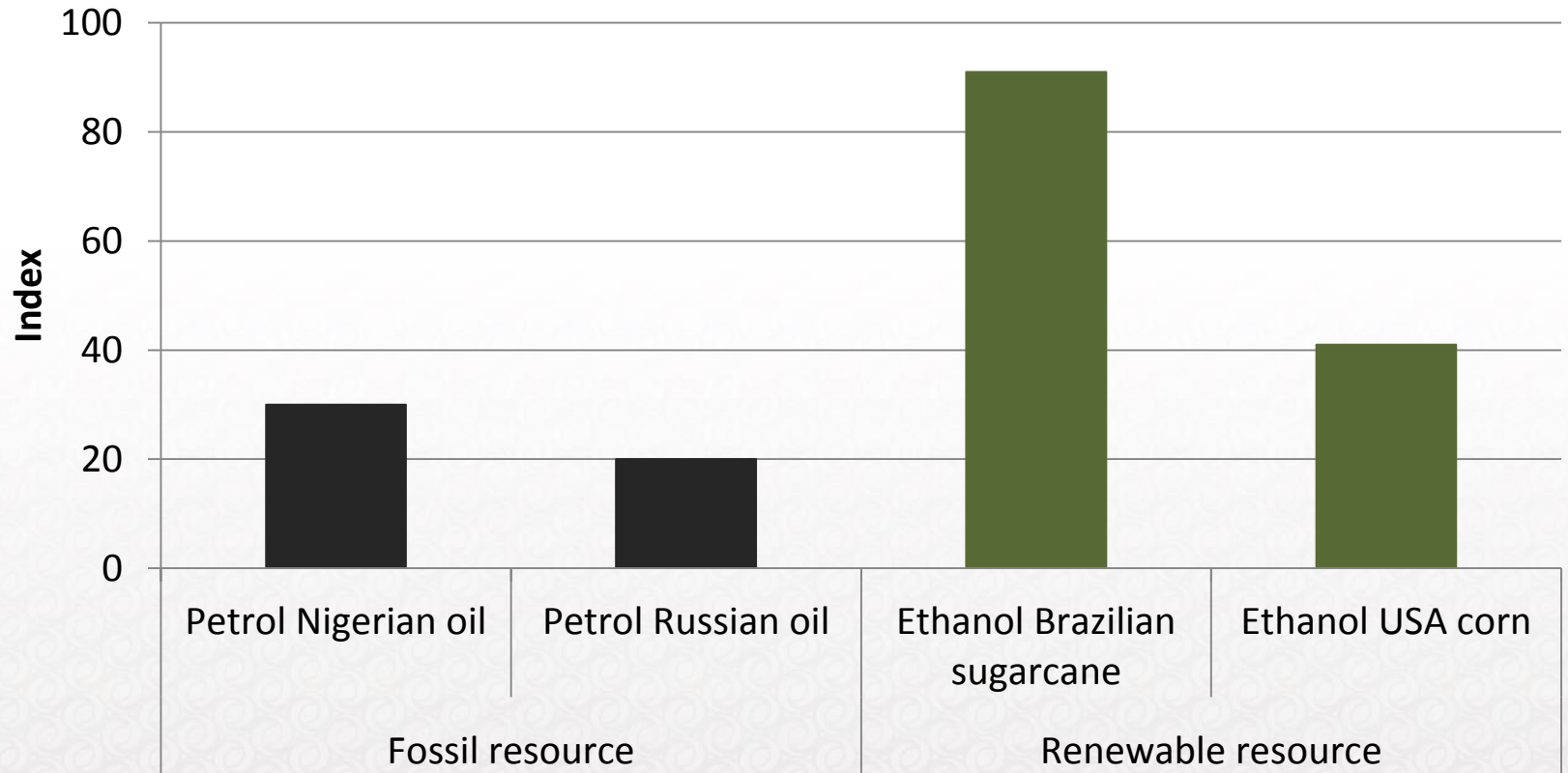
Results shown should not be used for current sustainability ranking

Same priority for all perspectives (High index represent more sustainable)



Results shown should not be used for current sustainability ranking

Egalitarian (prio social)



Thank you!

Projects financed by f3 – Swedish knowledge centre for renewable transportation fuels and Swedish Energy Agency



Shift

Sustainable Horizons in Future Transport

Integrate modal shifts, fuel options, and consumer behaviour into scenario modelling and in-depth analysis.
Financed by Nordic Energy Research

