

The future impact of ICTs on environmental sustainability

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Outline

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1. The project
2. Results
3. Conclusions

Set-up of the project

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Aims :

- explore & assess impacts of ICT on env. sustainability
- policy recommendations

Commissioned by:



Project consortium:



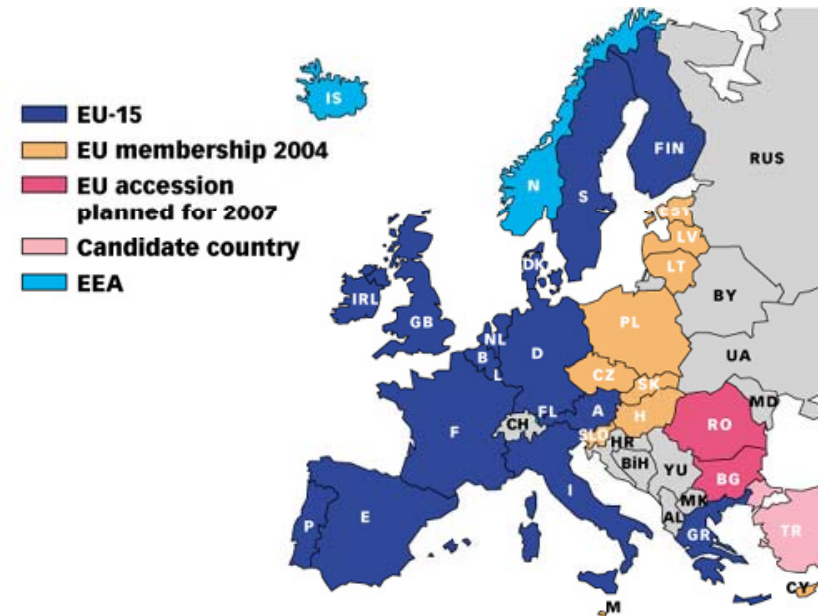
Future Impact of ICTs



Conceptual frame

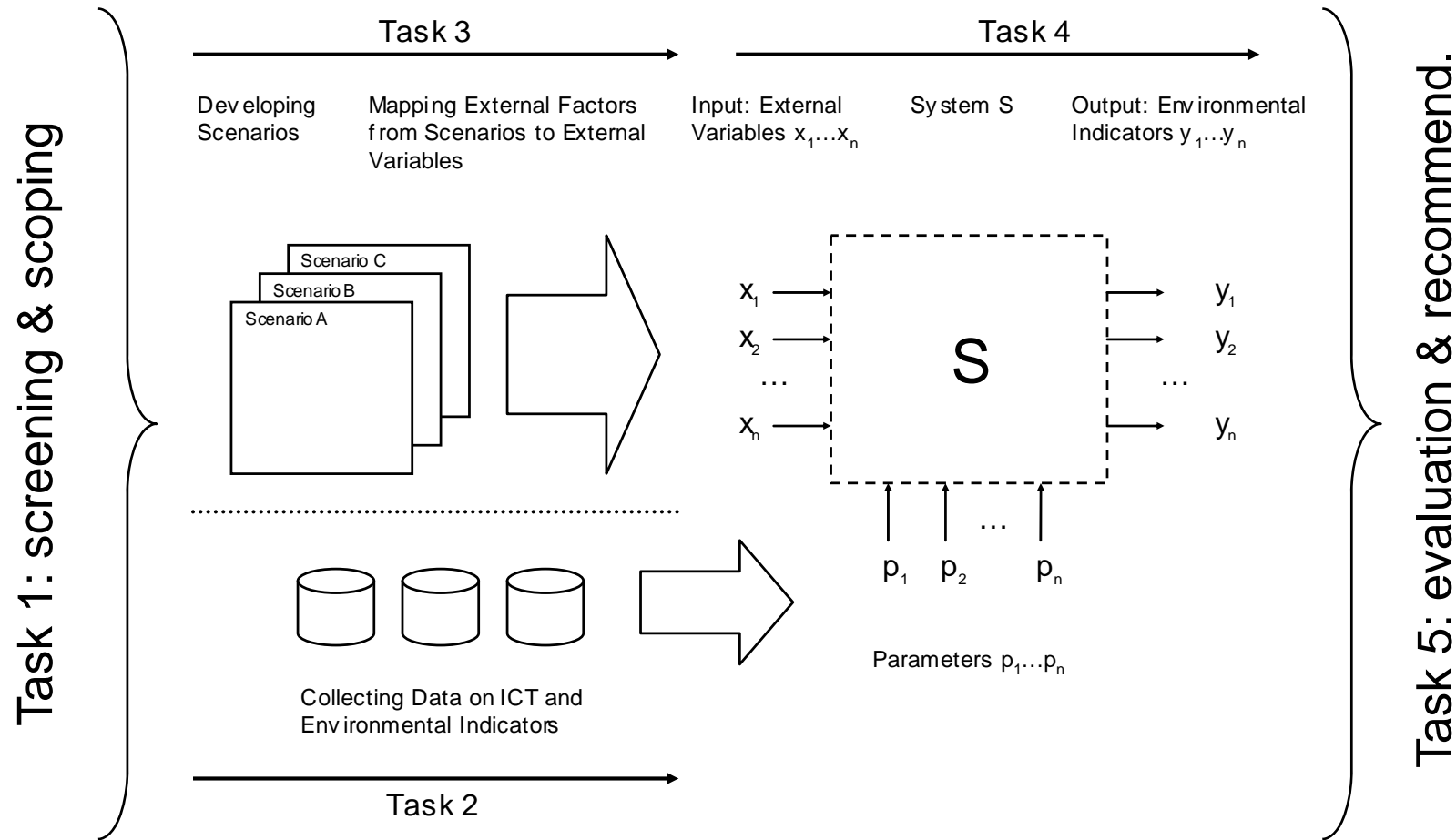
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- 1. First order**
physical existence
- 2. Second order**
use & application
- 3. Third order**
systemic effects



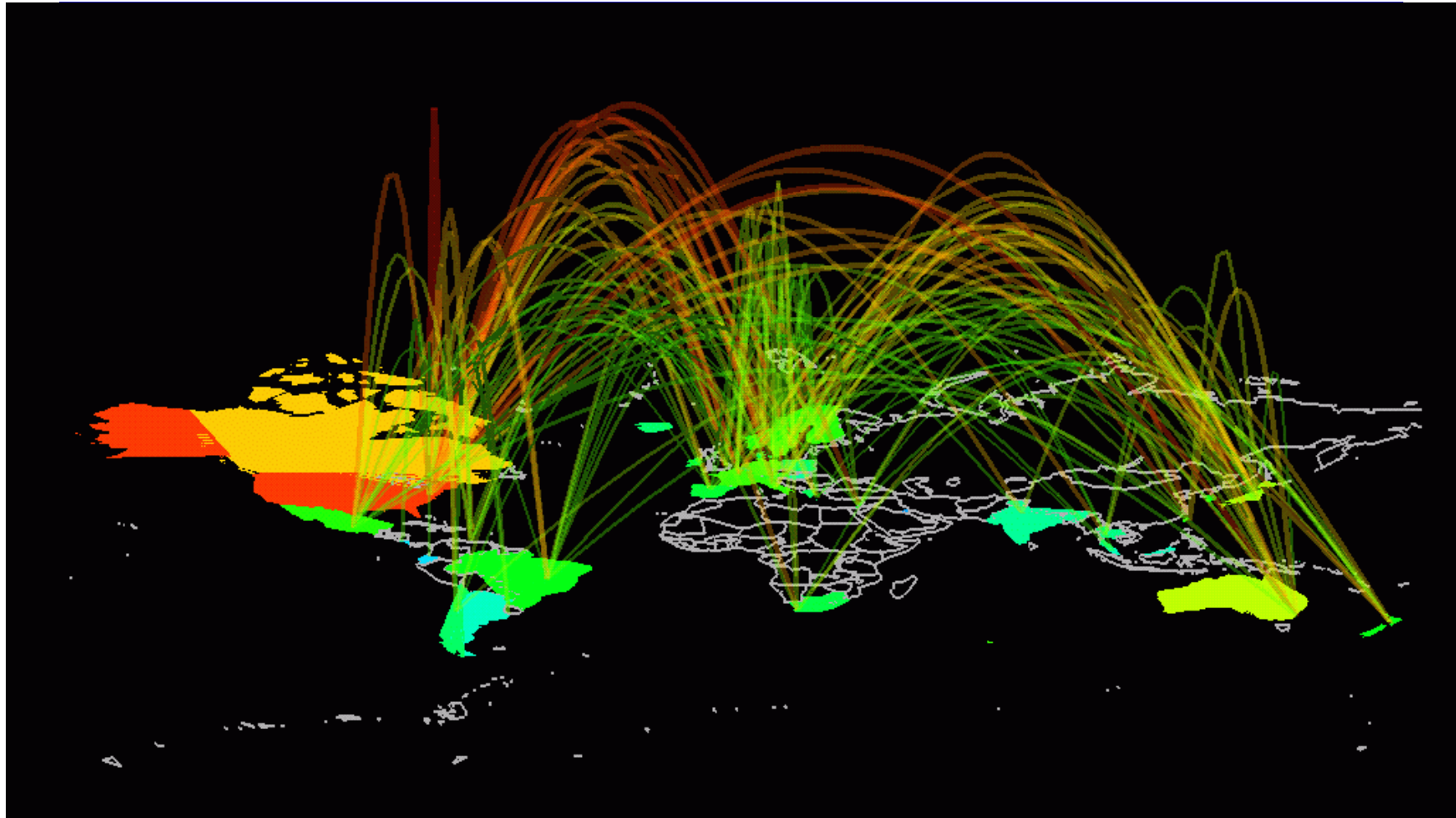
→ 2020

Integrated methodology



A weightless and frictionless economy?

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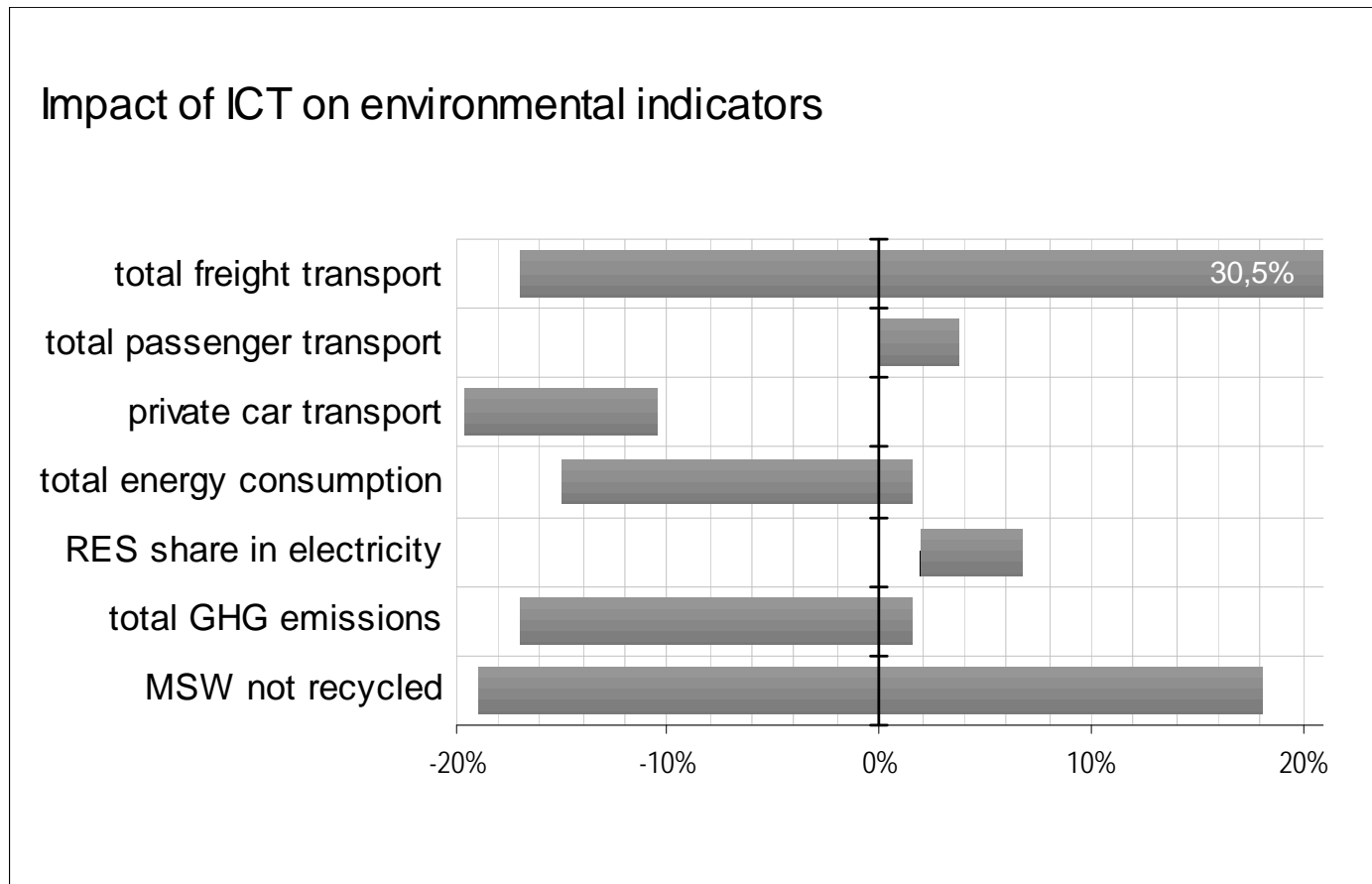


Future Impact of ICTs



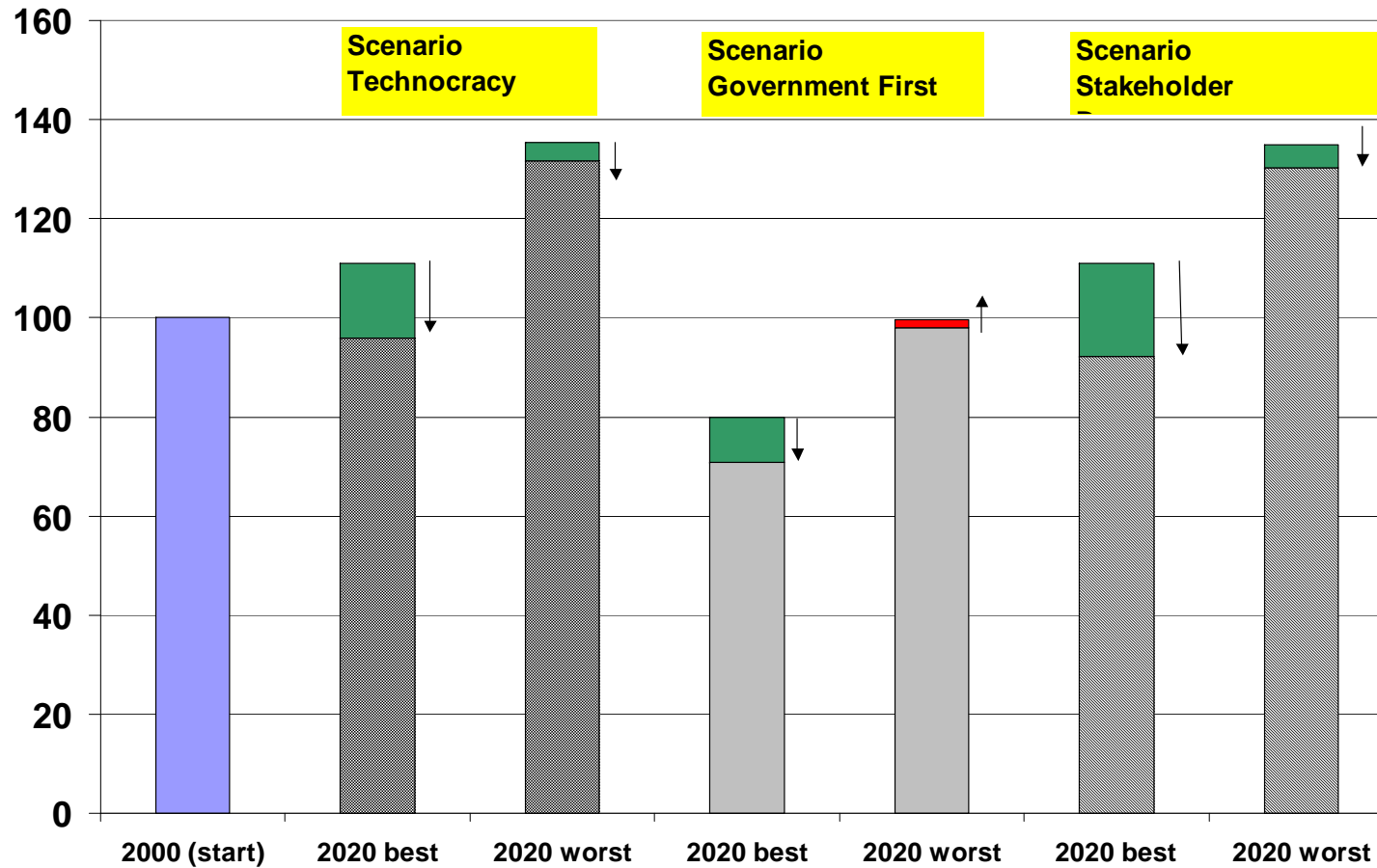
Overall future impact of ICTs on environmental sustainability

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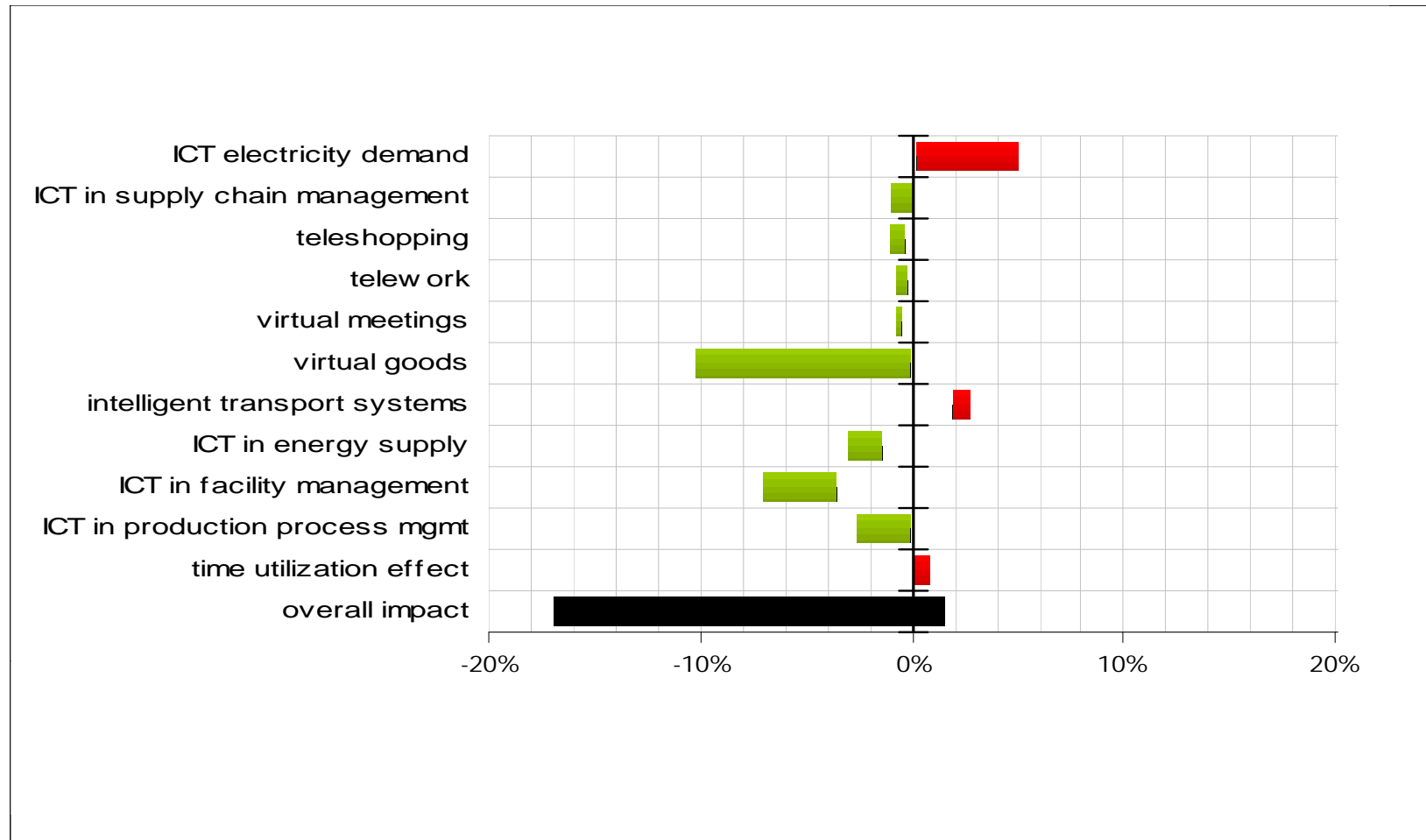
Interpretation of the results (GHG Emissions)

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Future impact of ICTs on GHG Emissions

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Future impact of ICTs on Energy Consumption

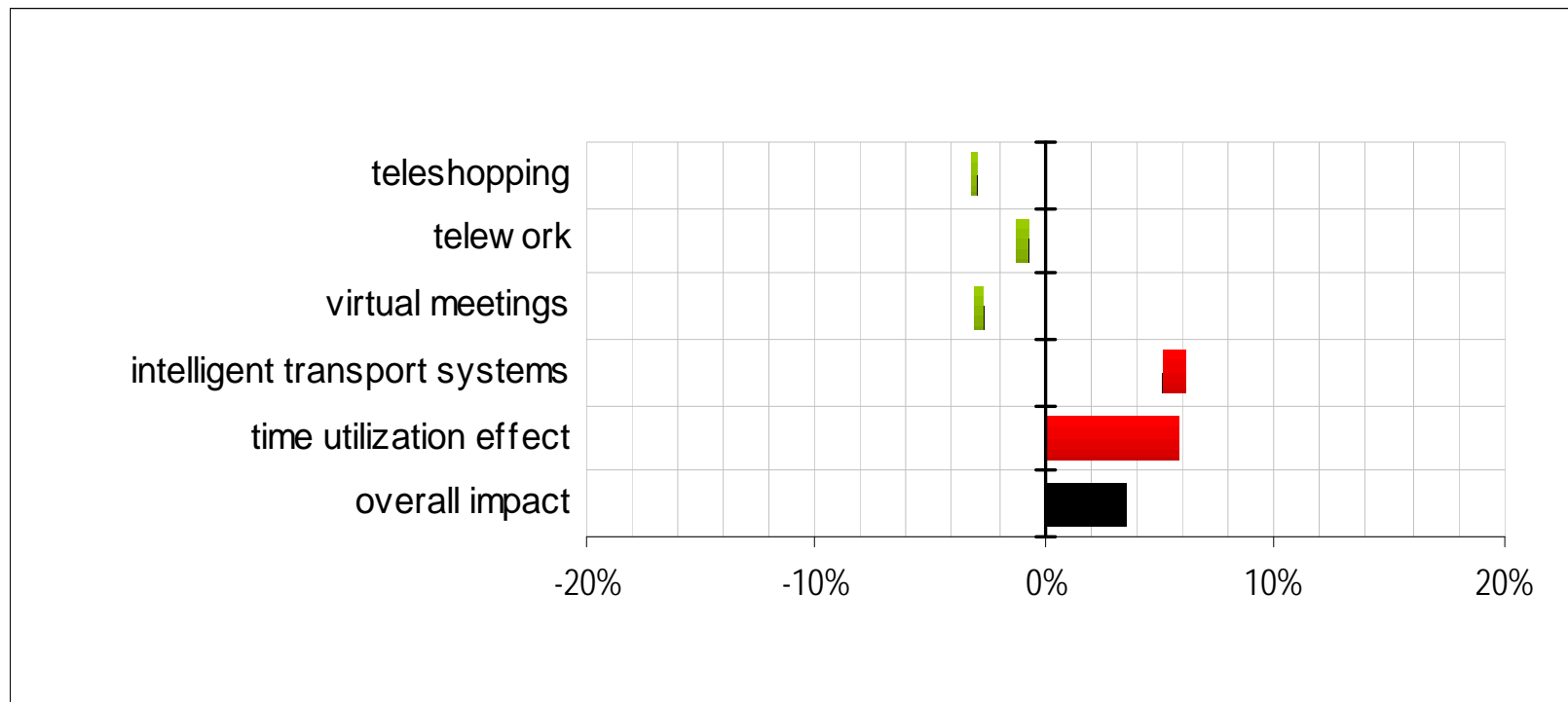
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- energy price is one of the, if not *the* strongest determinant affecting the outcome of the scenarios.
- energy consumption and GHG emissions behave similarly.

Rebound effect - ENERGY		
D&T Electricity Price Elasticity	Economic elasticity of electricity demand with regard to electricity price in the domestic and tertiary sector.	-0.5
D&T Heating Energy Price Elasticity	Economic elasticity of heating energy demand with regard to heating energy price in the domestic and tertiary sector.	-0.1
Industrial Energy Price Elasticity	Economic elasticity of industrial energy demand with regard to energy prices for industrial customers.	-0.5

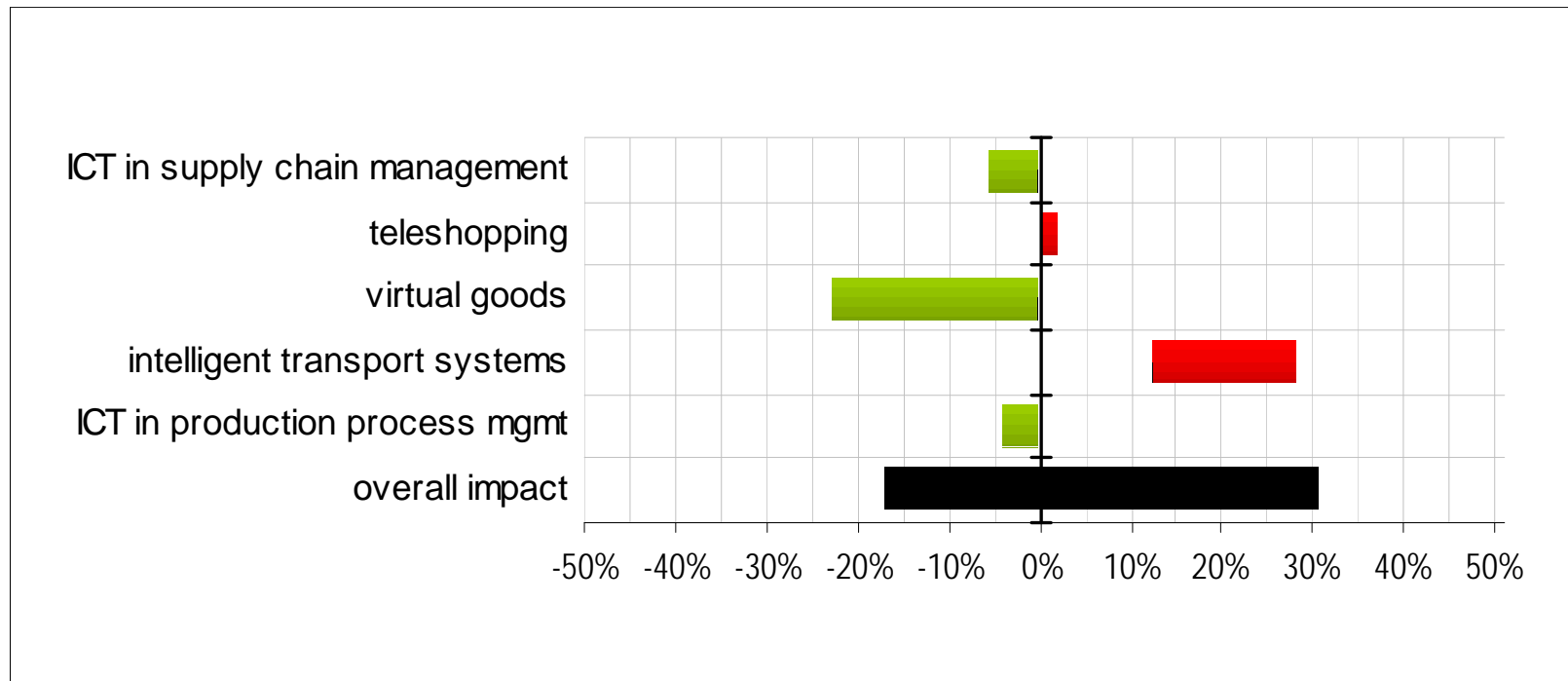
Future impact of ICTs on Passenger Transport

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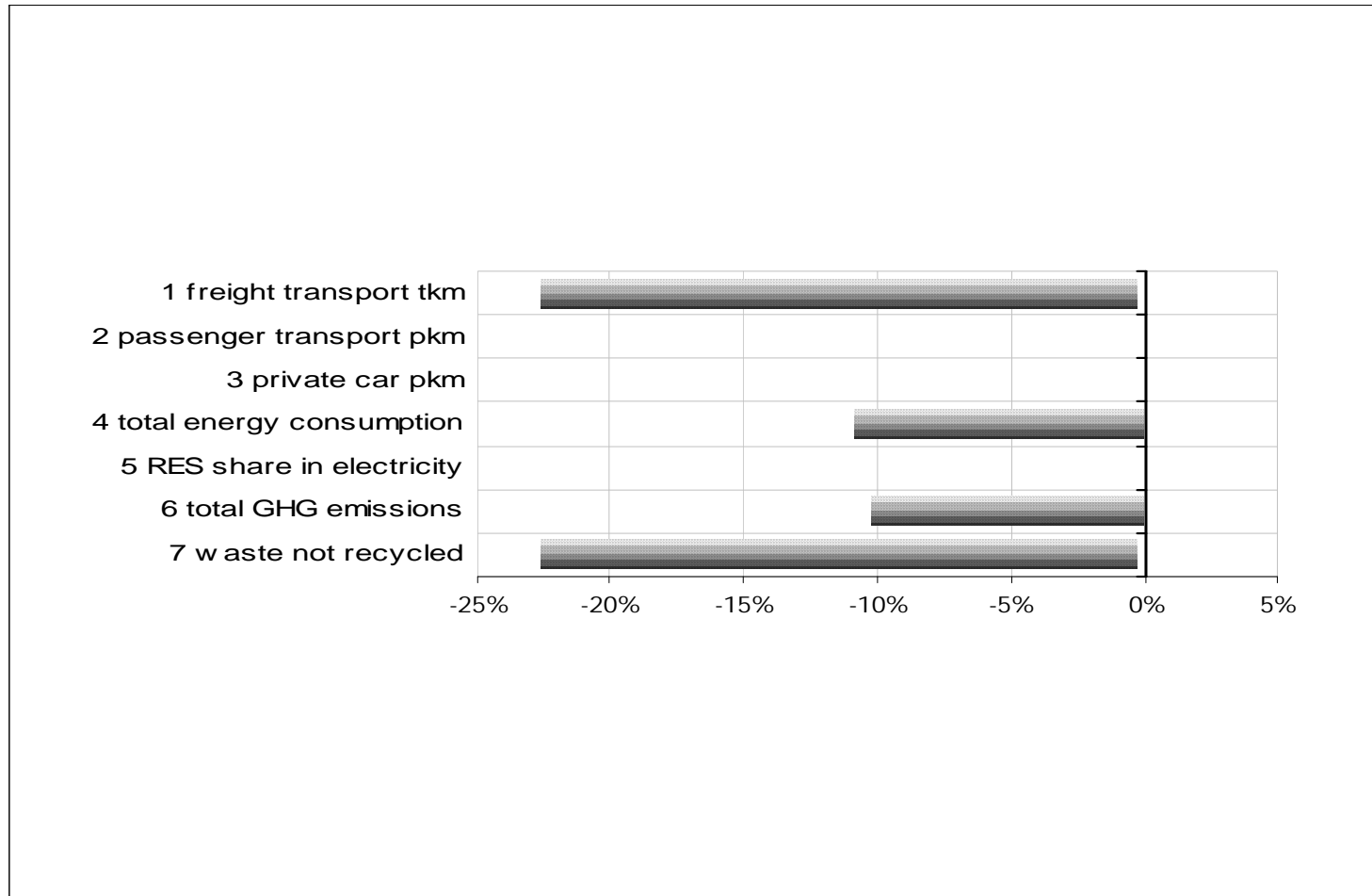
Future impact of ICTs on Freight Transport

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Future impacts of Virtual Goods on environmental sustainability

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Top areas for policies

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1. **Virtual goods:** up to > 20 % reduction of throughput, resulting in up to > 10 % GHG/energy reduction
2. **Facility Management:** 3,5 - 7 % reduction of GHG/energy
3. **ITS:** 1/8 to 1/4 increase of freight transport; > 5 % increase of passenger transport, but decrease of private car share
4. **SCM & PPC:** up to 10 % reduction of throughput
5. **Virtual mobility:** > 5 % reduction of passenger transport
6. **E-energy:** 5 % increase in renewables share
7. **First order impacts:** up to > 3 % of total energy consumption and up to 25 % share in MSW not recycled

Virtual Goods, Ambient Intelligence and Rebound Effects

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Case Studies:

- From Consumers to Prosumers (IZT and EBAY)
- Ambient Intelligence: e.g. Pay as you Drive / e-energy

Rebound Effects - GOODS AND SERVICES		
Industrial Materials Price Elasticity	Economic elasticity of industrial materials demand with regard to materials prices for industrial customers.	-0.5
Rematerialization Share Information Products	Which share of the content of virtual information products will be rematerialized by the user (i.e. by printing out information accessed via the Internet or burning it on CDs) in the long term?	0.5
Rematerialization Material Efficiency Factor	Average material efficiency of the rematerialization of virtual products in relation to production of material products.	0.3

What makes up a good study?

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1. Consider 1., 2. and 3. order effects
2. Ensure transparency and data quality
3. Account for uncertainties
4. Update und upscale studies
5. Integrate future scenarios
6. Adress policy integration