Integrating non-fiscal impacts into cost-benefit analyses of extractive industry projects

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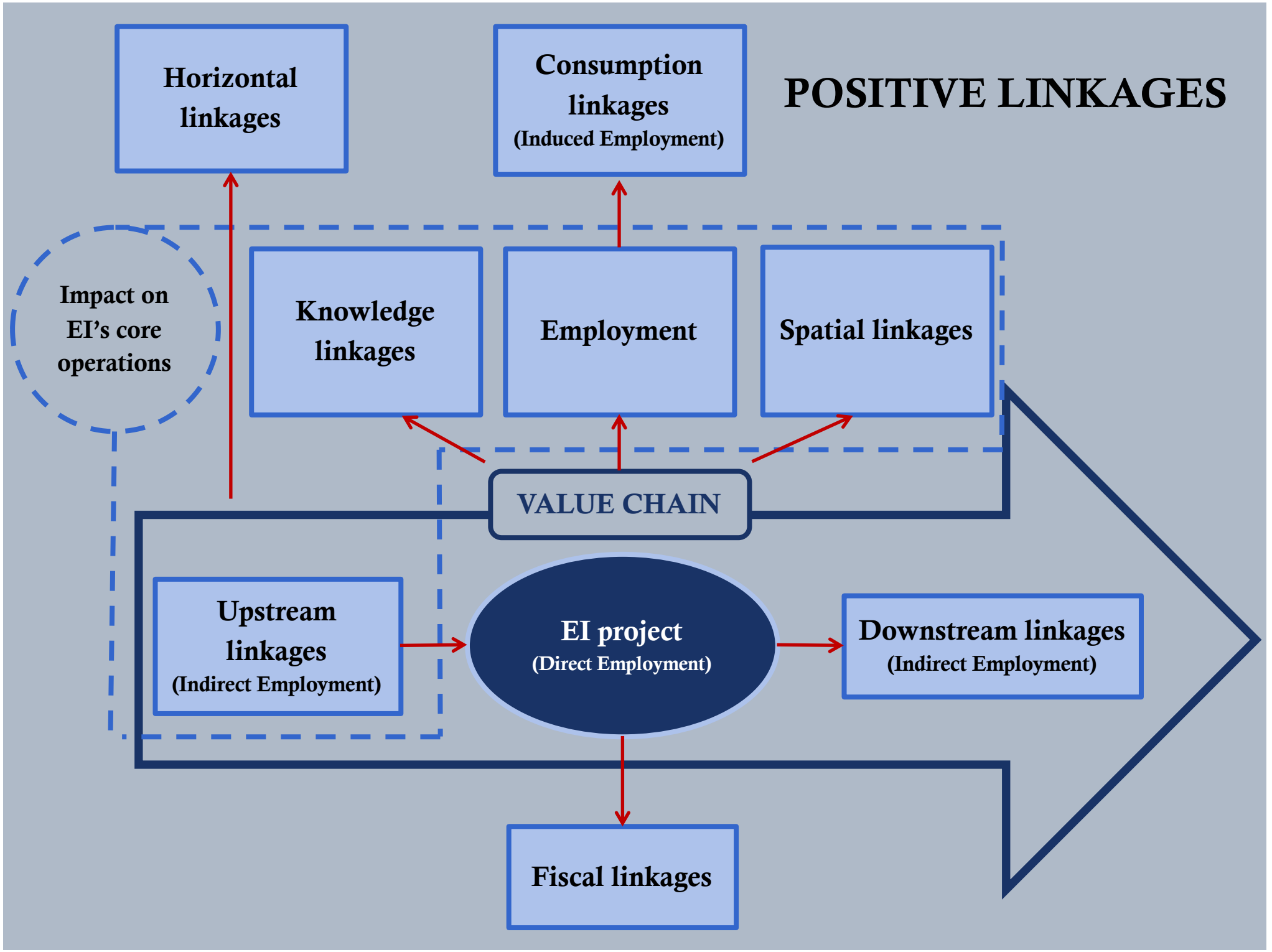
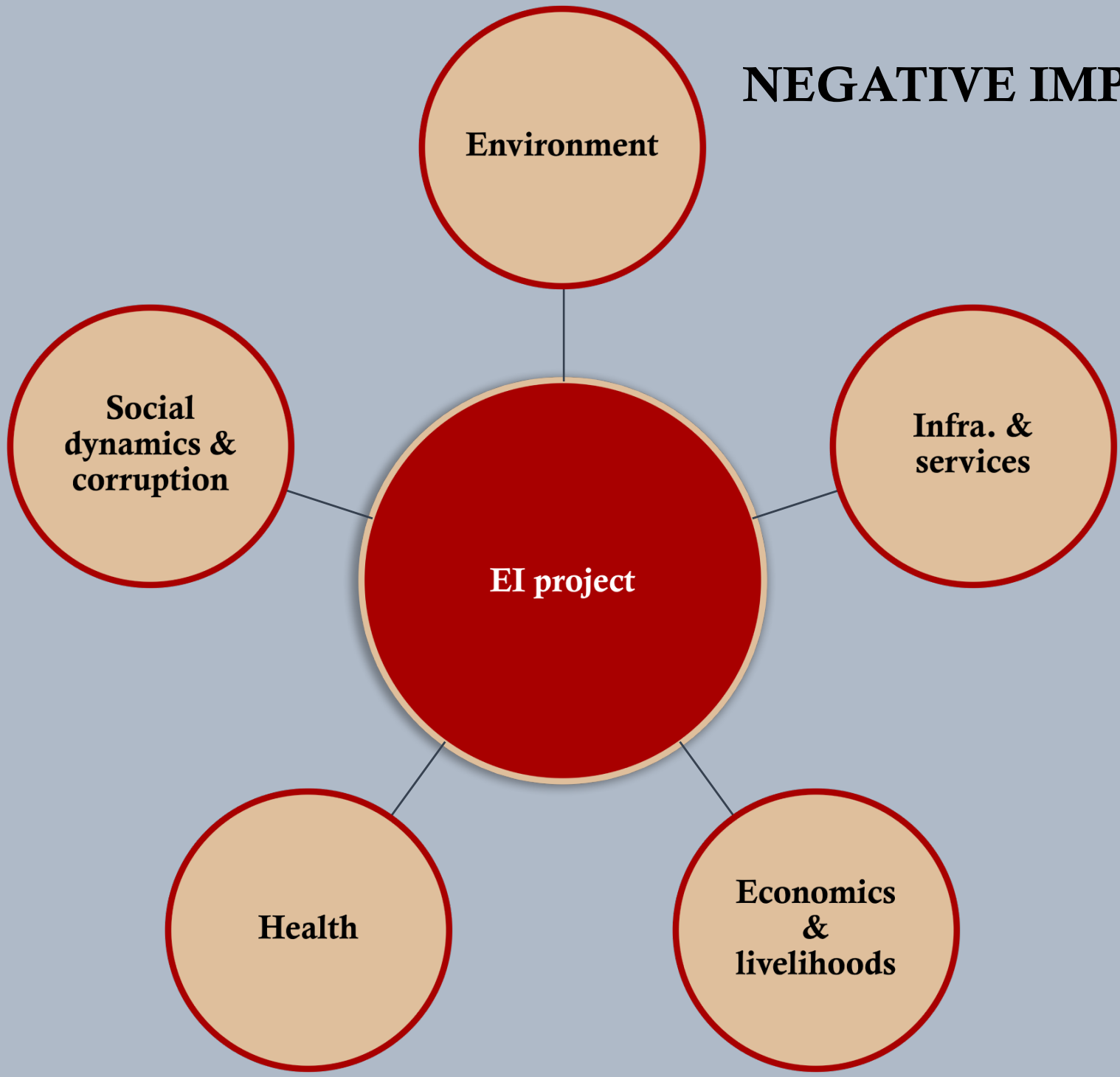
Columbia Center
on Sustainable Investment
A JOINT CENTER OF COLUMBIA LAW SCHOOL
AND THE EARTH INSTITUTE, COLUMBIA UNIVERSITY

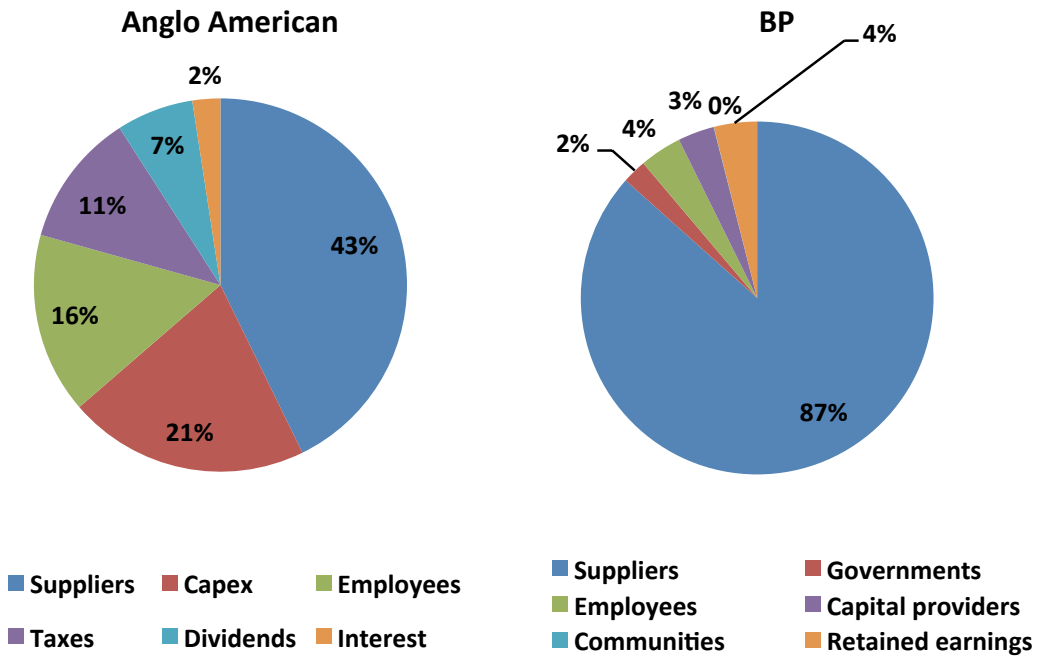

POSITIVE LINKAGES
Horizontal linkages
Consumption linkages (Induced Employment)
Impact on EI's core operations
Knowledge linkages
Employment
Spatial linkages
VALUE CHAIN
Upstream linkages (Indirect Employment)
EI project (Direct Employment)
Downstream linkages (Indirect Employment)
Fiscal linkages

NEGATIVE IMPACTS



Quantifying upstream impacts

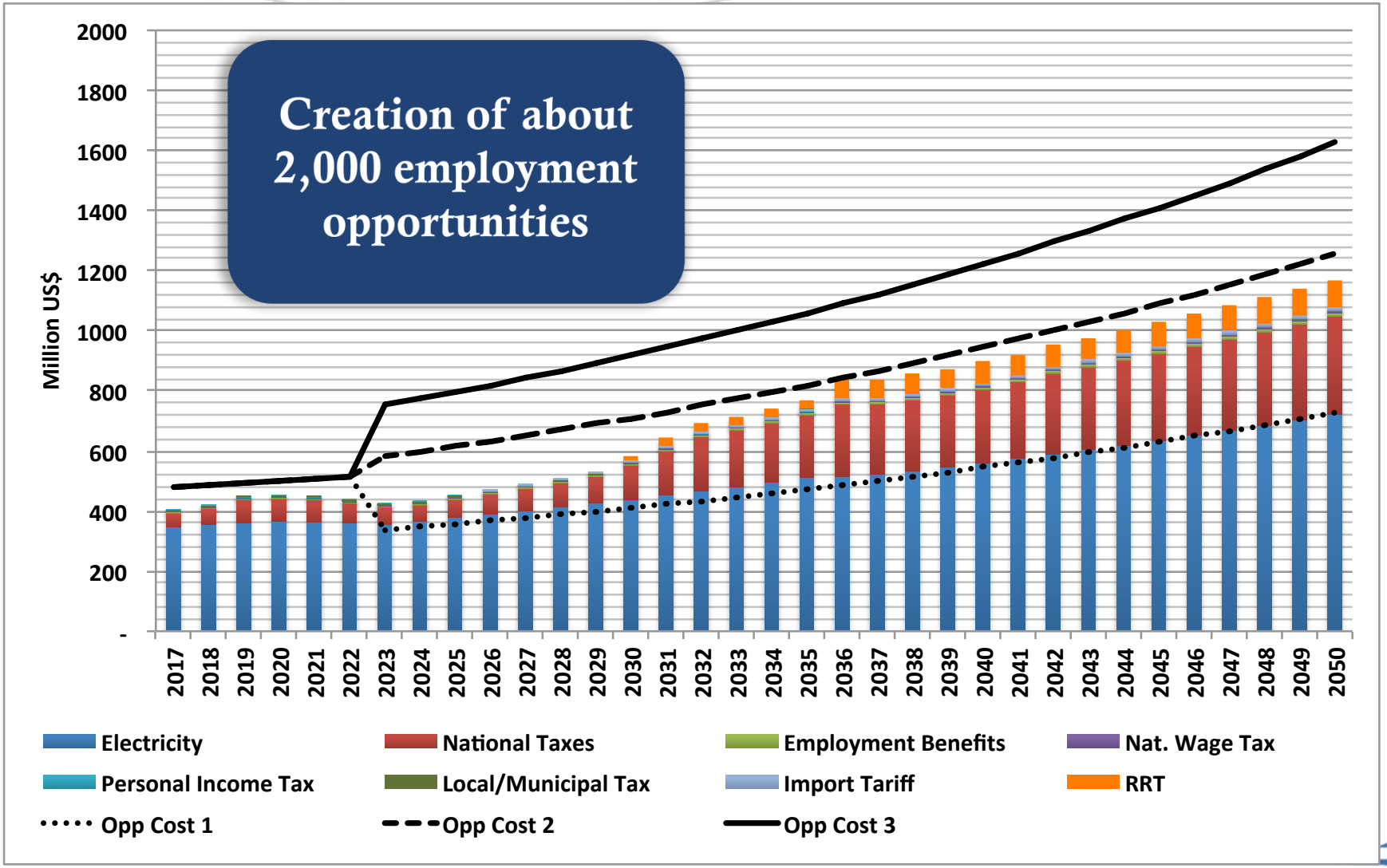
Value created in 2014



Employment multipliers vary significantly

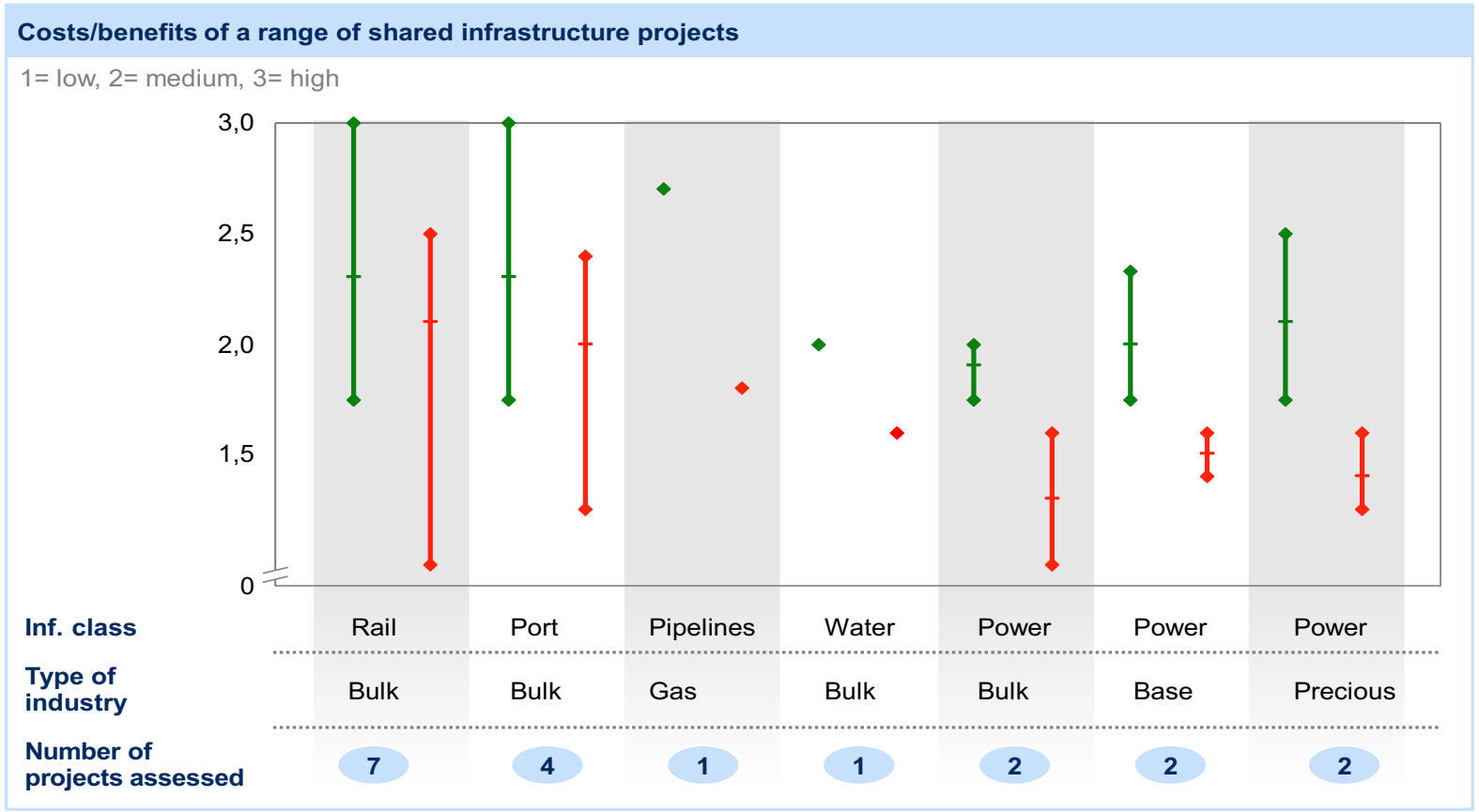
Industry	Location	Direct impact	Indirect impact	Direct and indirect impact	Source
Africa (not including South Africa)					
Mining	Tanzania	1.0	7.6	8.6	ICMM (2007)[58]
Gold mining	Tanzania	1.0	6.87	7.87	Ernst & Young (2013)[44]
Cooper mining	Zambia	1.0	2.61	3.61	ICMM (2014)[45]
Gold mining	Tanzania	1.0	3.0	4.0	World Gold Council (2009)[59]
Gold mining	Mali	1.0	6.0	7.0	United Nations Conference on Trade and Development (2007)[60]
Median value			***6.0***	***7.0***	

Quantifying downstream beneficiation impacts



Quantifying shared-use infrastructure impacts

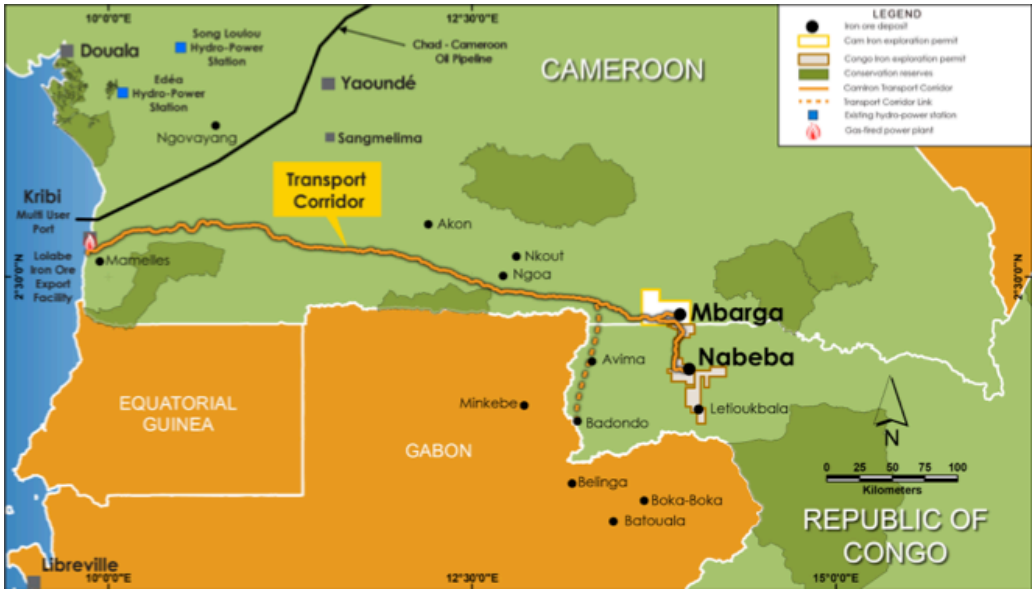
While sharing is generally beneficial, the associated costs vary substantially between projects



SOURCE: Vale Columbia Center; McKinsey Global Institute analysis

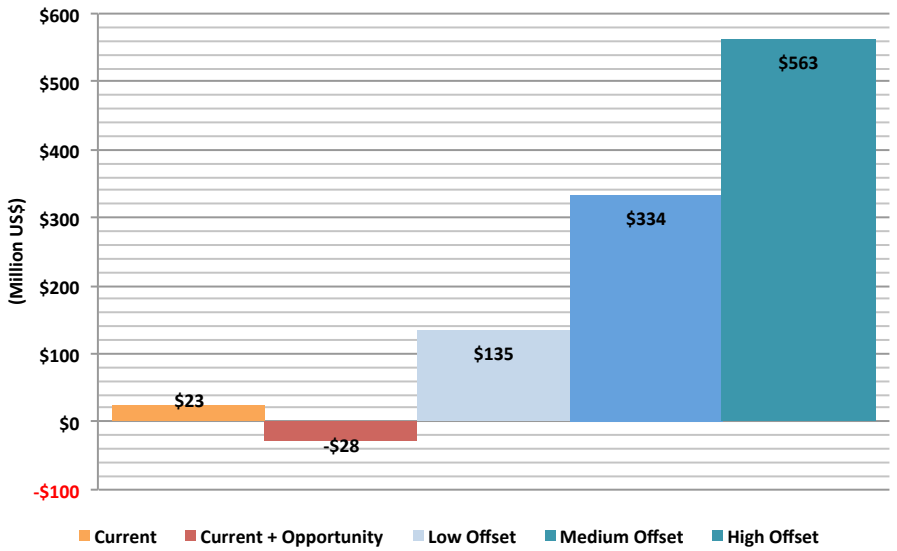
Quantifying GHG impacts

CamIron Project



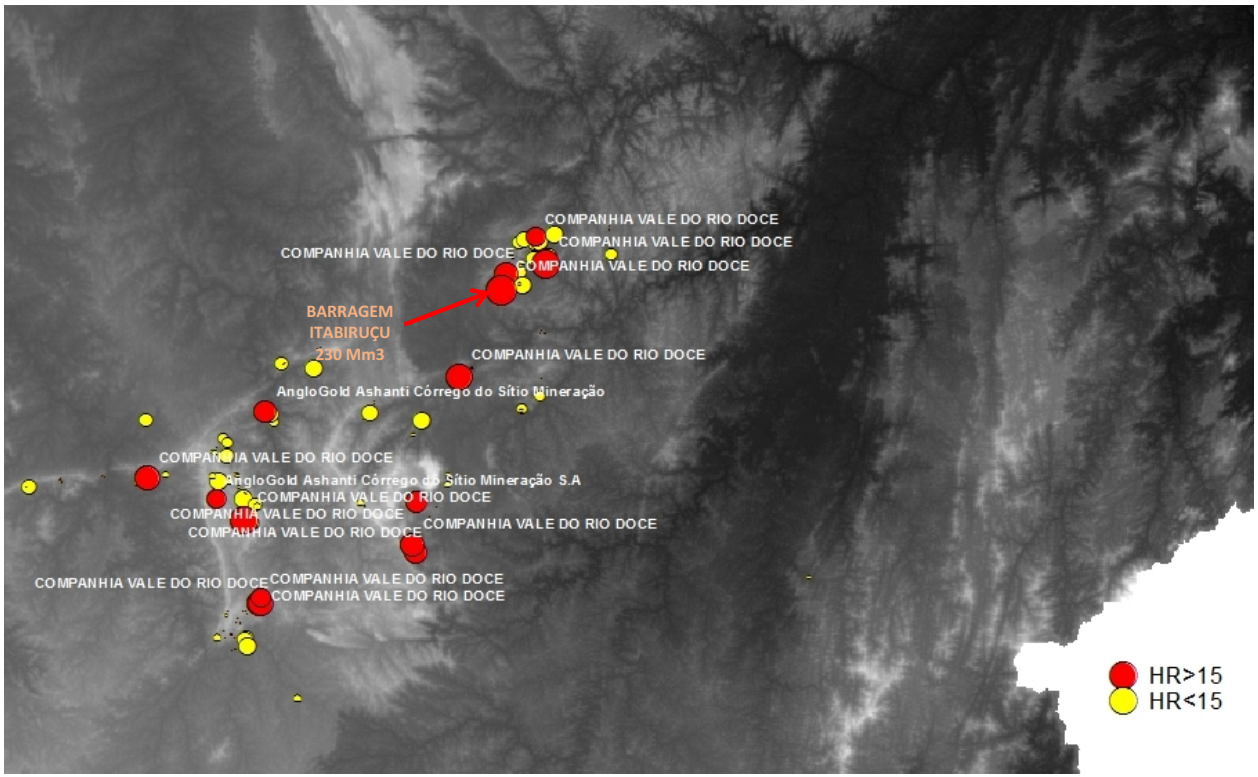
- 1,740 sqkm concession
- 580km railway line & port
- 35mtpa of iron ore
- 18 million tons of CO2 over project life

Carbon offset of CamIron CO2 footprint



- Proposal to protect Forest Management Unit 10034 - 164,000 ha of intact forest from logging by leasing area for $6/Ha per year
- If the concession remains unlogged, offset 4.5 million tons of CO2

Quantifying environmental risks



- Around 300 tailing dam failures have been reported between 1915-2016
- Overtopping is failure mechanism in 30-40% of cases
- Calculated hazard rating based on:
  - Dam height
  - Tailings stored
  - Distance traveled
  - Impacted area

Summing up

- Focus on fiscal aspects important particularly in the oil sector
- Non-fiscal positive linkages to extractive industry investments often reviewed/negotiated separately, but may be of key importance to both parties
- Negative externalities, risks and opportunity costs are not priced into project appraisals. However, these externalities are particularly relevant for impacted regions
- There is a need to provide stakeholders with tools to be able to integrate non-fiscal impacts of extractive industry investments in sector & project appraisals.
- Probalistic impact assessments improve with more data from existing case studies.
- Such tools could also help improve risk monitoring.