BIOFUELS – AT WHAT COST?

Impacts of subsidies for ethanol and biodiesel

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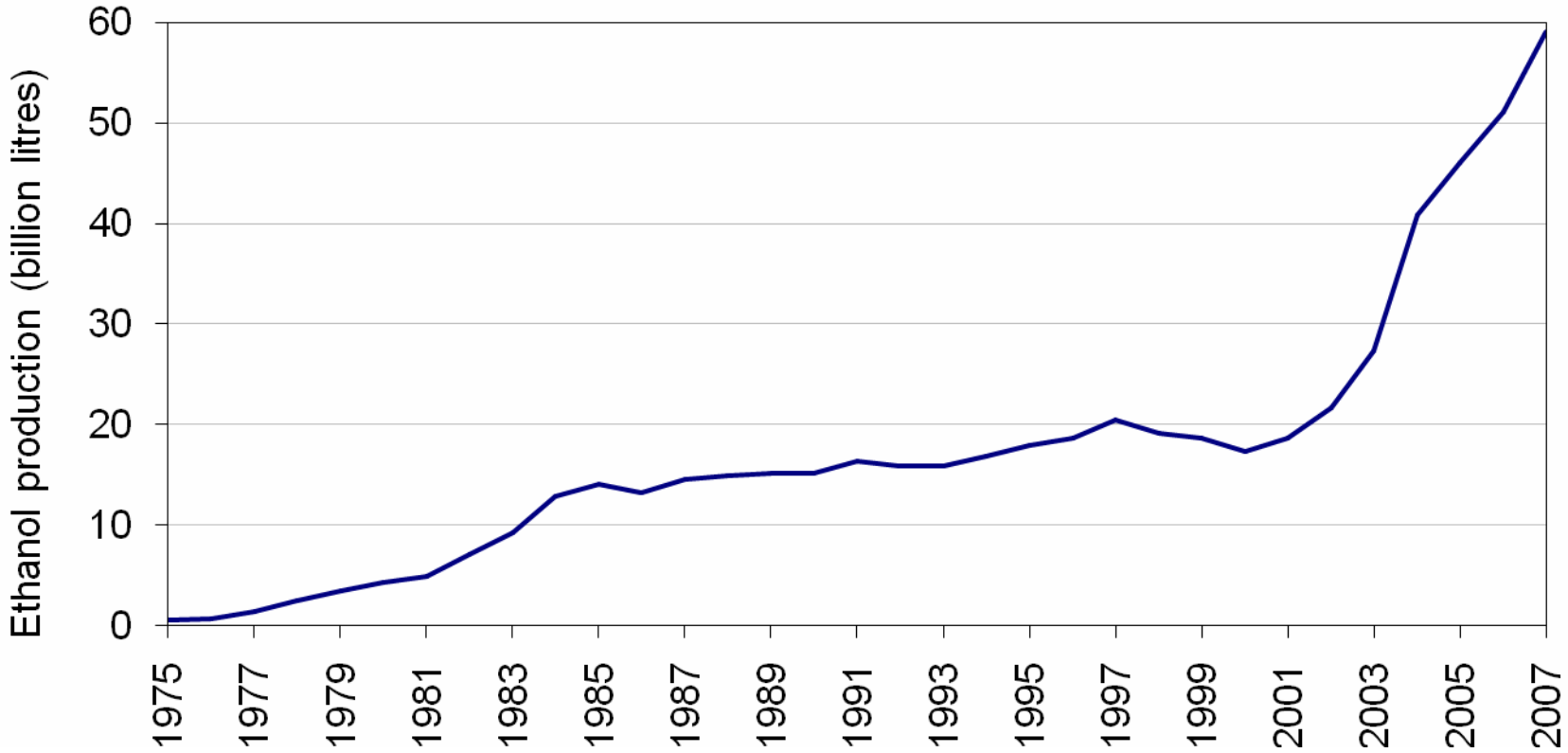
GSI Rationale

- Subsidies are powerful instruments
  - They can play a legitimate role in securing public goods that would otherwise remain beyond reach.
- Full transparency and public accountability for the stated aims of public expenditure must be the cornerstones of any subsidy program
- Even when subsidies are legitimate, are they effective?
- GSI's challenge to creators and maintainers of subsidies
  - demonstrate that the subsidies are environmentally, socially and economically sustainable - and that they do not undermine the development chances of some of the world's poorest producers

World ethanol production



Source: GSI (2007) using FO Licht data.

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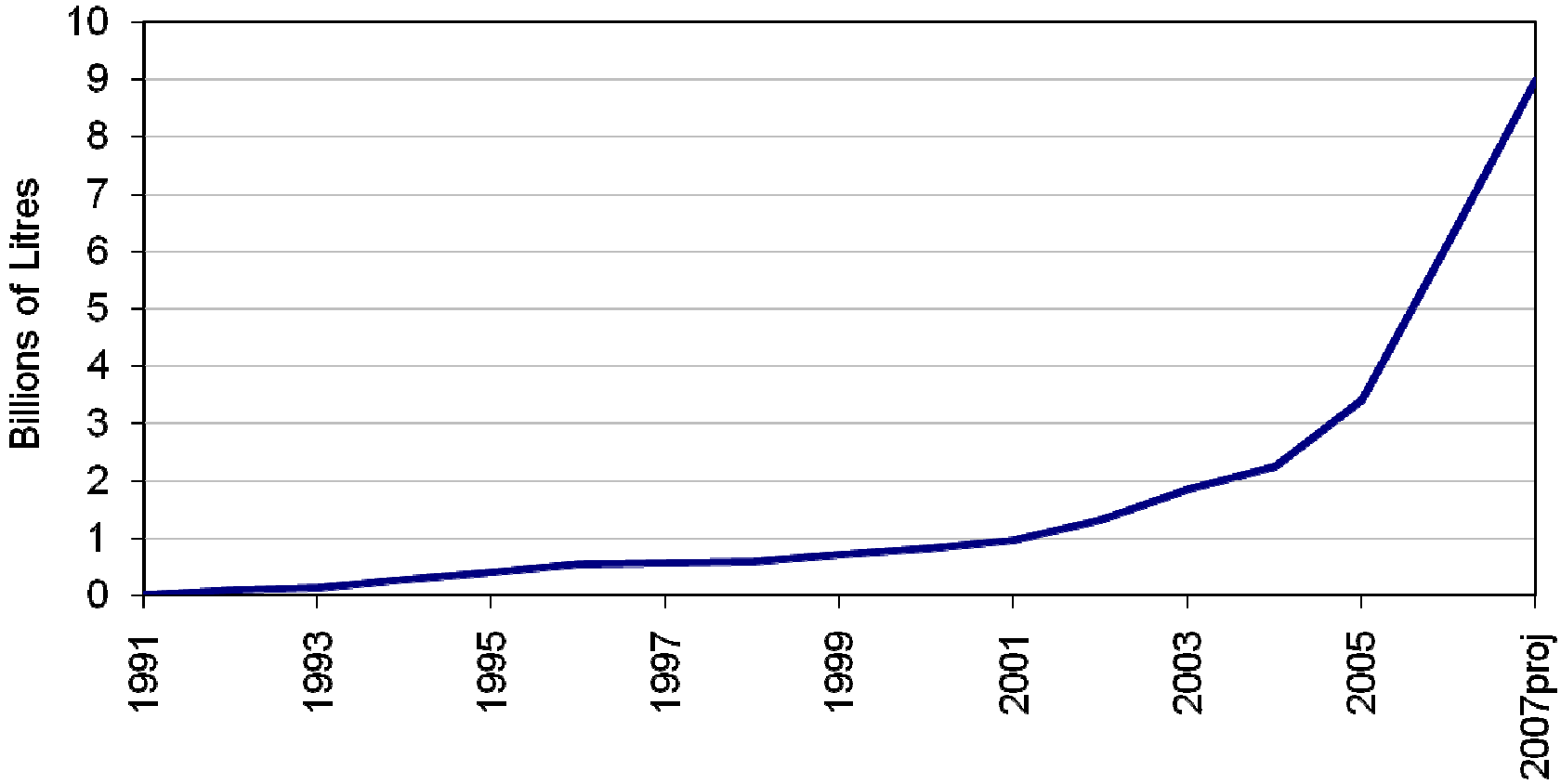
World biodiesel production



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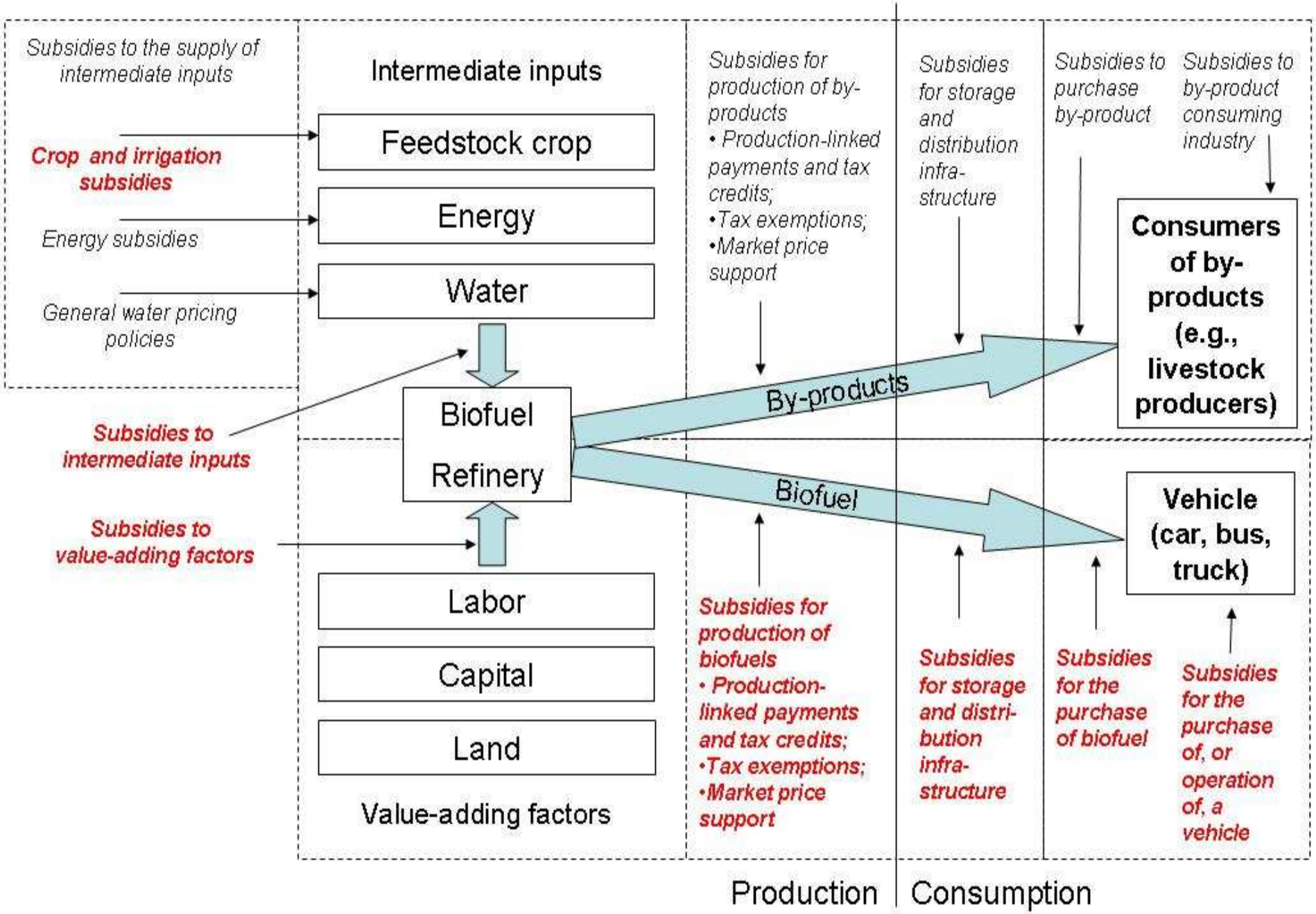
Subsidies to the supply of intermediate inputs
Intermediate inputs
Subsidies for production of by-products
• Production-linked payments and tax credits;
•Tax exemptions;
•Market price support
Subsidies for storage and distribution infra-structure
Subsidies to purchase by-product
Subsidies to by-product consuming industry
Crop and irrigation subsidies
Feedstock crop
Energy subsidies
Energy
General water pricing policies
Water
Consumers of by-products (e.g., livestock producers)
By-products
Subsidies to intermediate inputs
Biofuel Refinery
Biofuel
Vehicle (car, bus, truck)
Subsidies to value-adding factors
Labor
Capital
Land
Value-adding factors
Subsidies for production of biofuels
• Production-linked payments and tax credits;
•Tax exemptions;
•Market price support
Subsidies for storage and distri-bution infra-structure
Subsidies for the purchase of biofuel
Subsidies for the purchase of, or operation of, a vehicle
Production
Consumption

Total OECD subsidies: over US$13 billion per year

OECD economy (year of data)	Ethanol	Biodiesel	Total liquid biofuels
	Total support estimate (US$ billion)		
United States (2007)	6.9	1.2	8.1
EU (2006)	1.6	3.1	4.7
Canada (2006)	0.15	0.013	0.163
Australia (2007)	0.043	0.032	0.075
Switzerland (2006)	0.001	0.009	0.01
Total	**8.7**	**4.35**	**13.05**

Notes: Lower end of estimates used.
Sources: GSI reports, 2007 and 2008.

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Assumptions and Assertions

	Claim	GSI Analysis
1	Biofuel subsidies save governments money by reducing farm payments	Volumetric Payments for fuels more than compensate
2	Mandating biofuels will save motorists money by reducing fuel prices	Biofuel mandates stop switch to cheapest fuels
3	Subsidizing biofuels is a cost-effective way of reducing reliance on fossil-fuels	Costs typically $0.50/litre. Biofuels have security issues too
4	Subsidizing biofuels is a cost-effective way to reduce GHG transport emissions	$160-5500/t$CO_2$ in GSI studies
5	The need for subsidies is temporary	If combination of high oil prices and breakthrough technology
6	Subsidies are needed to establish distn. infrastructure and fuel-use flexibility	Blends don't need new infrastructure

Malaysia Case Study

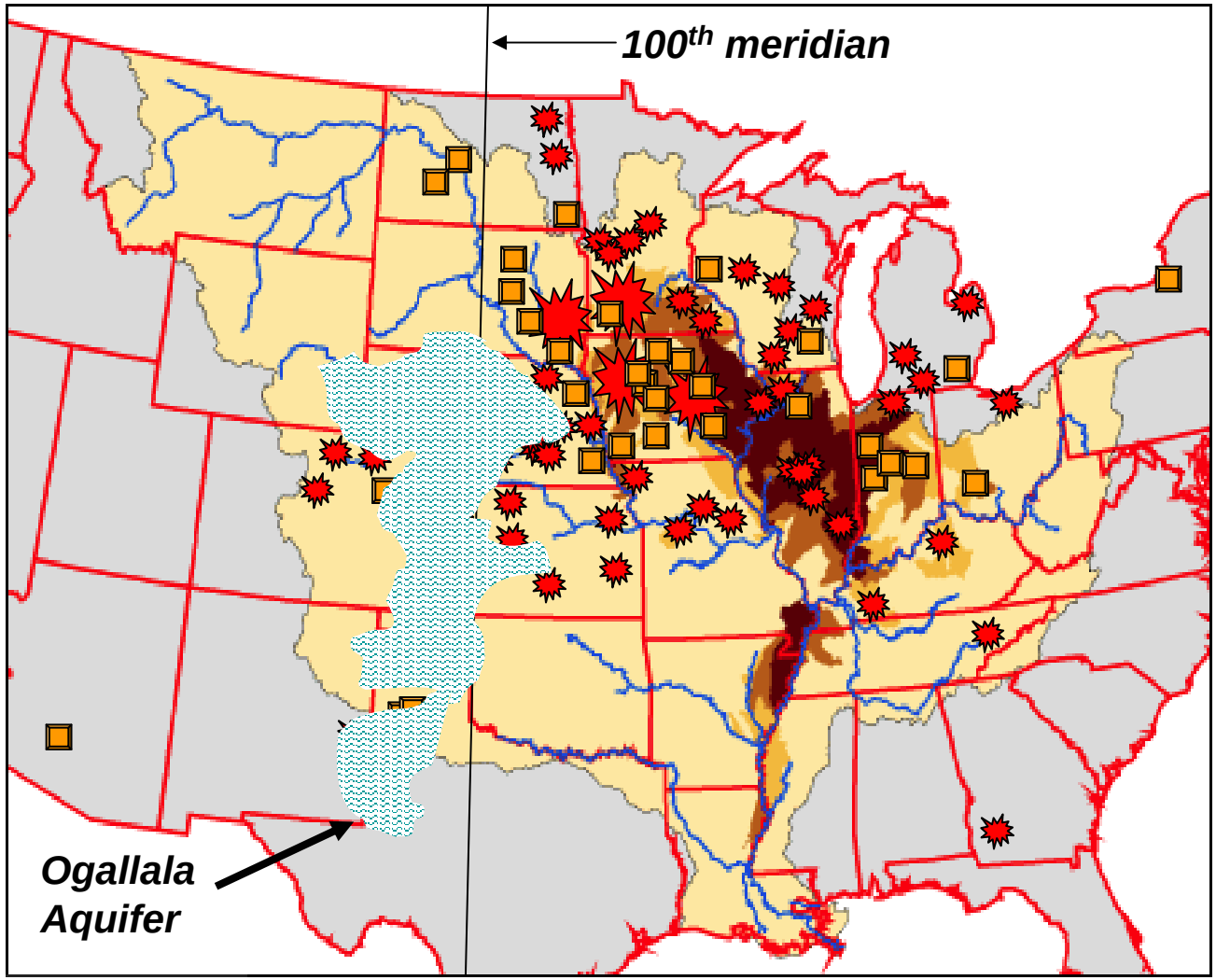
- Rising palm oil prices from 2006 put a firm brake on Malaysia's B5 biodiesel mandate
  - but biofuels policies elsewhere (EU and US) have pushed up commodity prices strongly
- Potential for land grabs – tenure uncertain
- Increased GHG emissions over life cycle?
- Corruption; forest clearing; marginal land
  - lack of independent, accountable institutions

Environmental impacts of crops

Risk factor	Permanent grass	Wheat	Oilseed rape	Maize
Erosion	Low	Low	Medium	High
Soil compaction	Low	Low	Low	Medium
Nutrient leaching to ground and surface water	Low	Low	Medium-high	High
Pesticide pollution to soil and water	Low	Medium	High	High
Water abstraction	Low	Medium	n/a	Low-Medium

Source: European Environment Agency Report 7/2006, June 2006

Location of biorefinery plants in relation to the Mississippi River Basin



Legend

- Existing biorefinery
- 10 existing biorefineries
- Biorefineries under construction, Oct 06
- Top tier of counties, nitrate runoff
- Top two tiers of counties, nitrate runoff
- Top three tiers of counties, nitrate runoff

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Summary Conclusions

- Subsidies drive production
- Sustainable development rationale for biofuels but significant unintended effects
  - major spill-over effects to other markets
  - a mounting body of evidence on the environmental effects of producing biofuel feedstocks on a large scale

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