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Market prospects for biofuels in key regions

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Market prospects

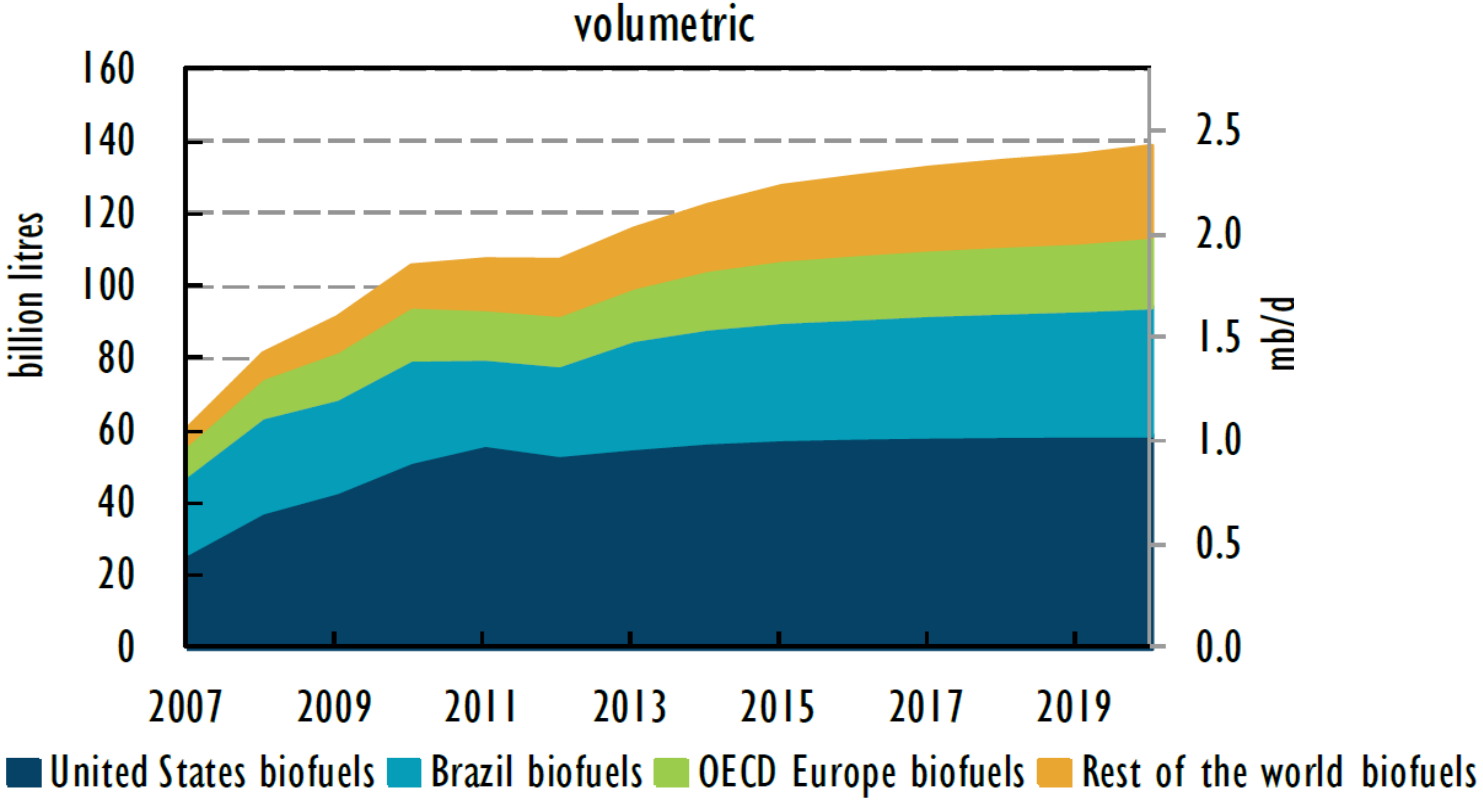
- Global outlooks
- Regional estimates

Key factors affecting market prospects

1. Policies
2. Markets of oil and agricultural commodities
3. Technology developments

Global market prospects

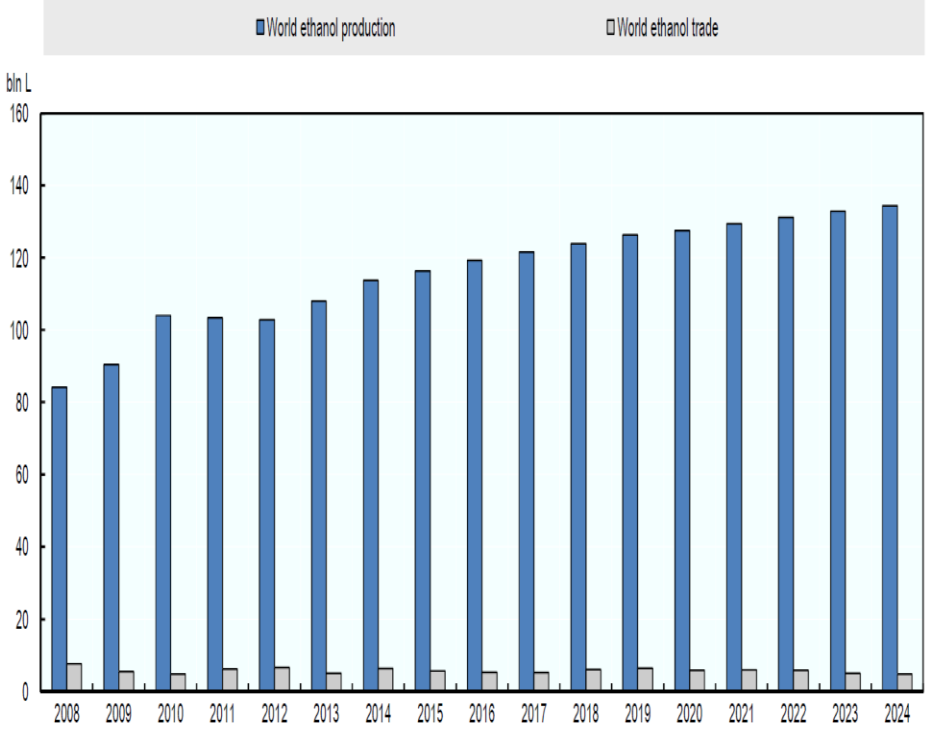
IEA:
Stabilisation to modest growth



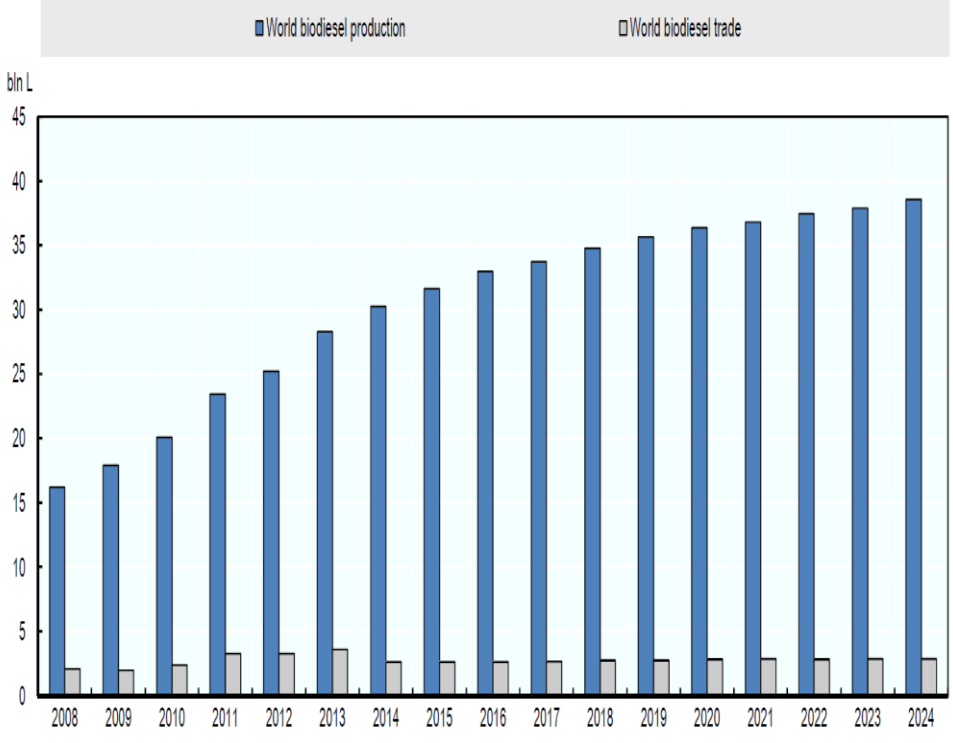
IEA medium-term renewable energy market report 2014

FAO Agricultural outlook: modest growth

Bioethanol

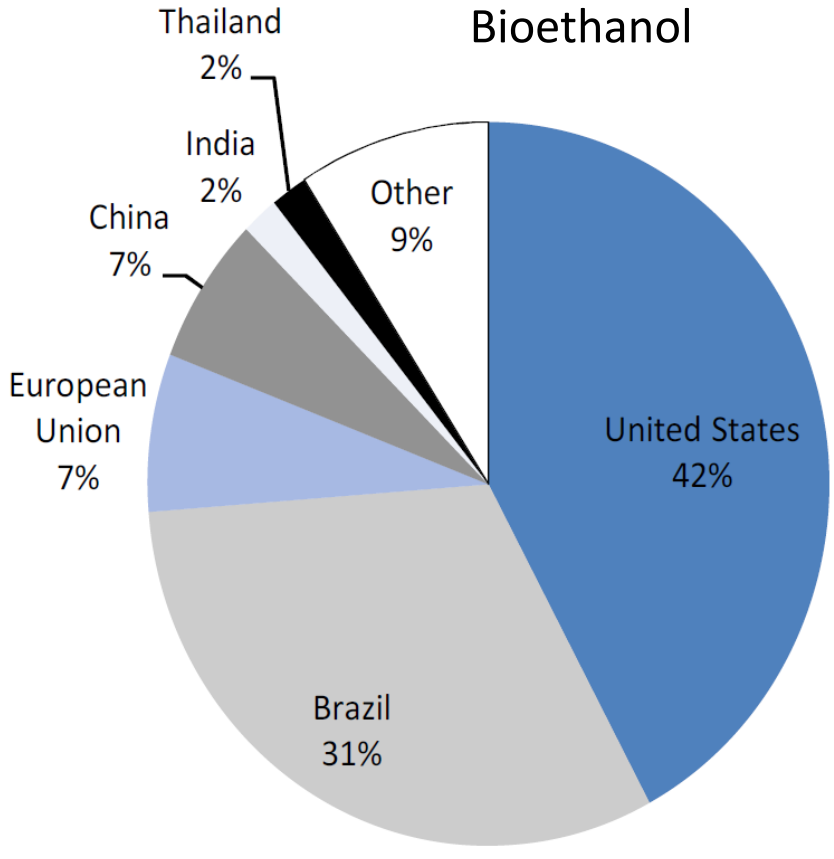


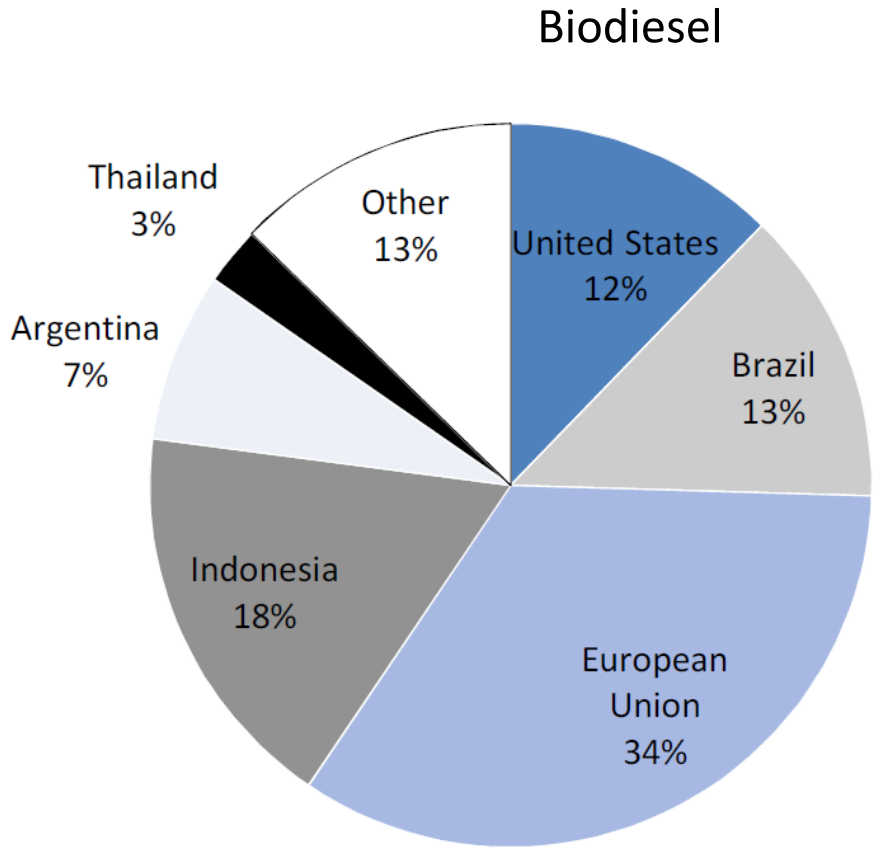
Biodiesel



OECD-FAO Agricultural Outlook 2015

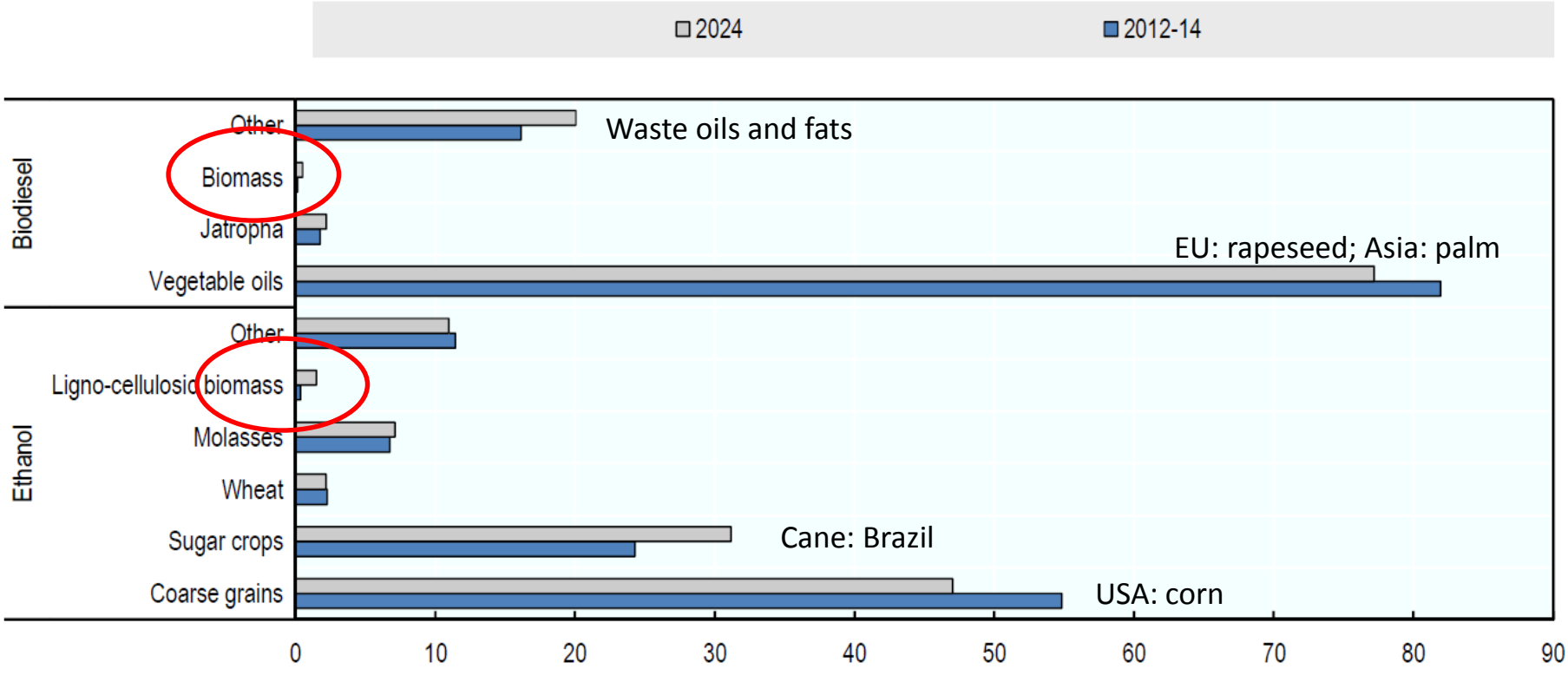
Key production regions: Projection 2024





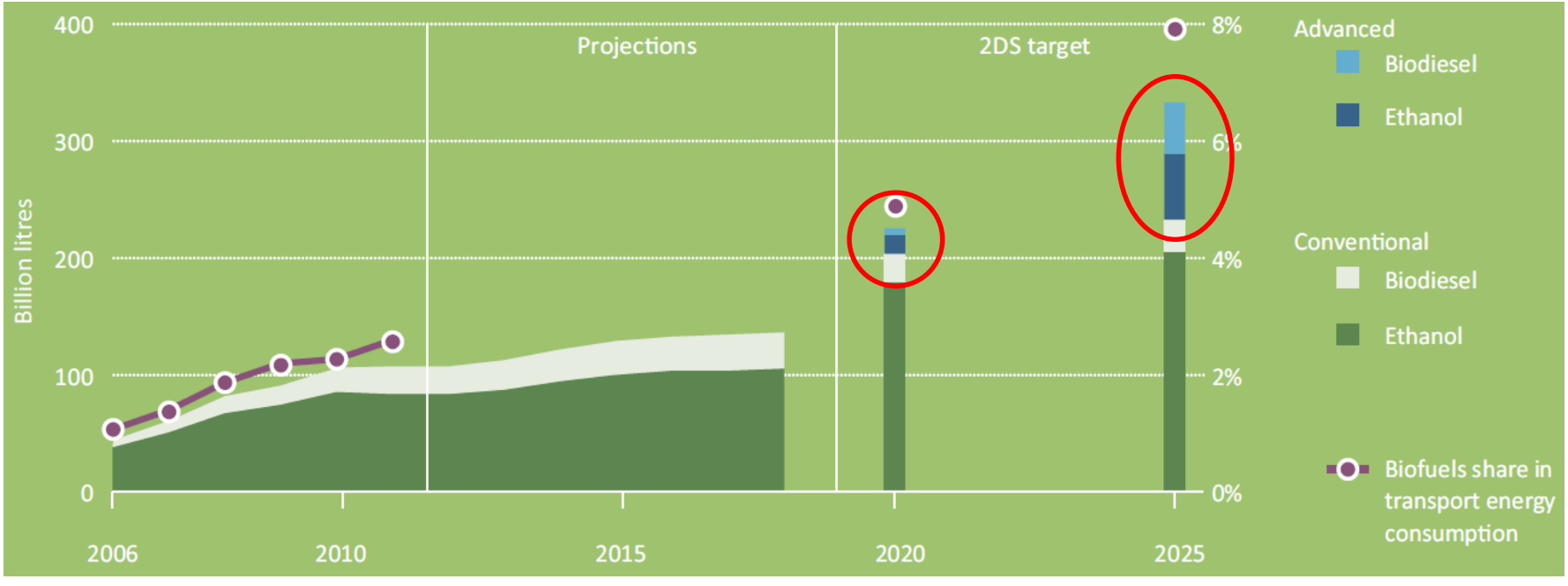
OECD-FAO Agricultural Outlook 2015

Key feedstocks: FAO Projection 2024



OECD-FAO Agricultural Outlook 2015

IEA: Advanced lignocellulosic options essential, faster growth



IEA Energy Technology Perspectives 2014

Regional estimates

Market status and outlook

North America: Stabilisation
• Reduction of targets
• Declining gasoline fuel demand
• Blending wall issues
• Specific advanced biofuel targets, but difficulties in meeting them
• Biodiesel also stabilising
	Europe: Minor growth towards 2020
	• Policy uncertainty resolved:
	  • 7% cap on crop-based biofuels,
	  • 0,5% indicative target for advanced
	• But no biofuels target for 2030
	• So uncertain conditions for advanced

Latin America: Steady growth
• Stable or increasing mandates
• Low margins in cane-based ethanol
• Increasing exports for ethanol
• Decreasing exports for biodiesel
	Emerging markets: Strong growth
	• New blending mandates in Asia, Africa
	• Key objectives:
	  • Energy security,
	  • Rural development
	  • Export

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Regional growth rates

Billion L	2013	2014	2015	2016	2017	2018	2019	2020	CAGR
OECD Americas	57.3	59.0	60.1	60.5	60.6	60.5	60.6	60.4	0.8%
United States	55.3	56.9	57.8	58.3	58.5	58.7	58.8	58.8	0.9%
OECD Europe	14.3	16.0	16.9	17.5	17.9	18.2	18.5	19.3	4.4%
OECD Asia Oceania	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.6%
Total OECD	**72.7**	**76.2**	**78.3**	**79.3**	**79.7**	**80.0**	**80.3**	**81.0**	**1.6%**
Non-OECD Europe	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.5%
China	2.3	2.6	2.8	3.0	3.2	3.2	3.4	3.5	6.6%
Non-OECD Asia	6.3	7.0	7.8	8.4	9.0	9.5	9.8	10.3	7.2%
Non-OECD Americas	34.2	36.0	37.7	38.5	39.5	40.4	41.1	42.1	3.0%
Brazil	30.1	31.7	32.7	33.2	33.9	34.3	34.8	35.7	2.4%
Middle East	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9.8%
Africa	0.2	0.5	0.8	1.0	1.1	1.3	1.3	1.5	29.5%
Total Non-OECD	**43.5**	**46.6**	**49.7**	**51.4**	**53.4**	**55.0**	**56.3**	**58.1**	**4.2%**
Total World	**116.3**	**122.8**	**128.0**	**130.7**	**133.1**	**135.0**	**136.6**	**139.1**	**2.6%**

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Key factors of uncertainty

1. Biofuel policies

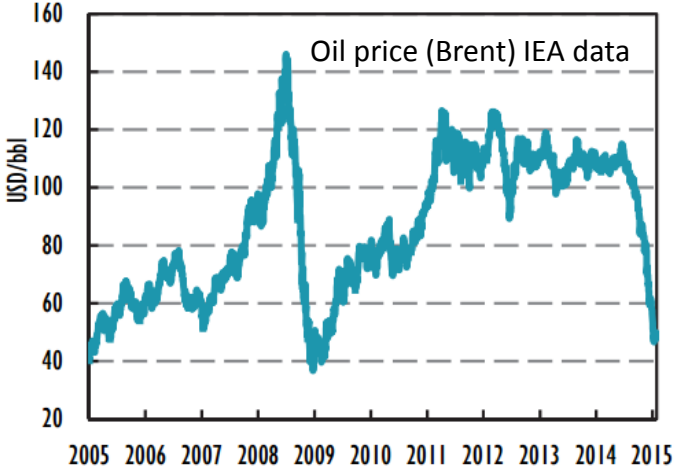
- Mandates as the key policy workhorse for biofuels
- Supporting policies:
  - Tax incentives
  - Infra development support
  - R&D support
- Biofuels come at a cost…
- … the sustainability dispute goes on and related policies are under further development…
- ….so there is inherent uncertainty on policy frameworks

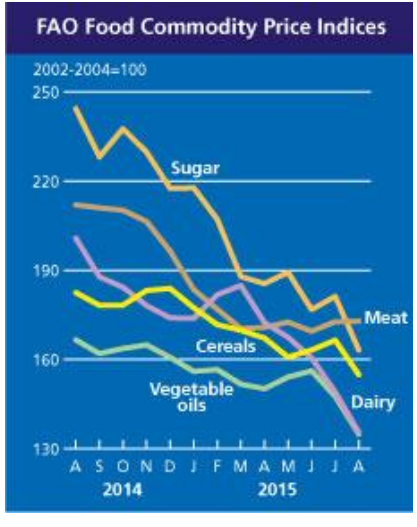
World countries with biofuel mandates

(Global Renewable Fuel Alliance)

2. Oil and agri markets

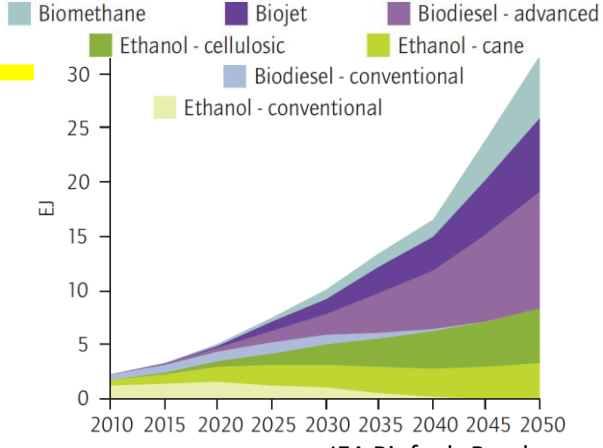
- Mandates create a separate market for biofuels
- But oil and agri commodity markets have a strong impact on their profitability
- Oil and agri price developments are quite strongly related
- Market changes have different impact on conventional and advanced options



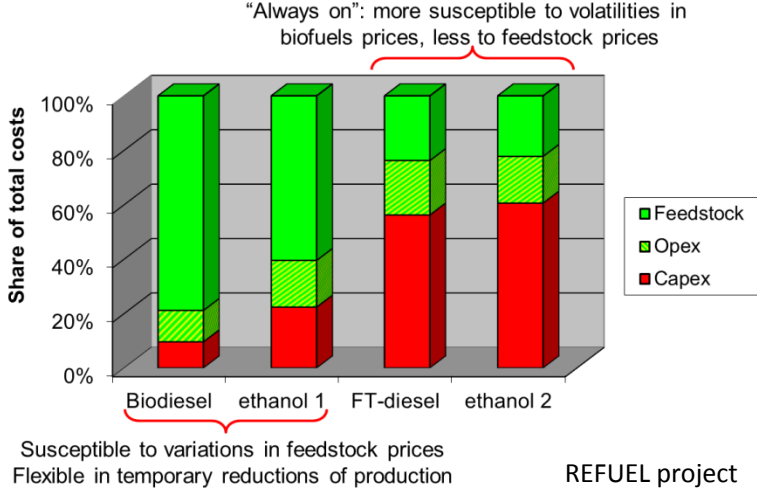


3. Technology development

- Advanced technologies are key:
  - Broadening the resource base (residues vs crops)
  - Generally better sustainability profiles (GHG, land, water)
- Middle distillates are essential:
  - For aviation and shipping
  - Europe: gasoline/diesel split
- But technologies are (still) complex and costly:
  - Gasification
  - Cellulose hydrolysis
- And they are very susceptible to (policy uncertainty)



IEA Biofuels Roadmap



REFUEL project

Thank you!

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