The economics of biofuels

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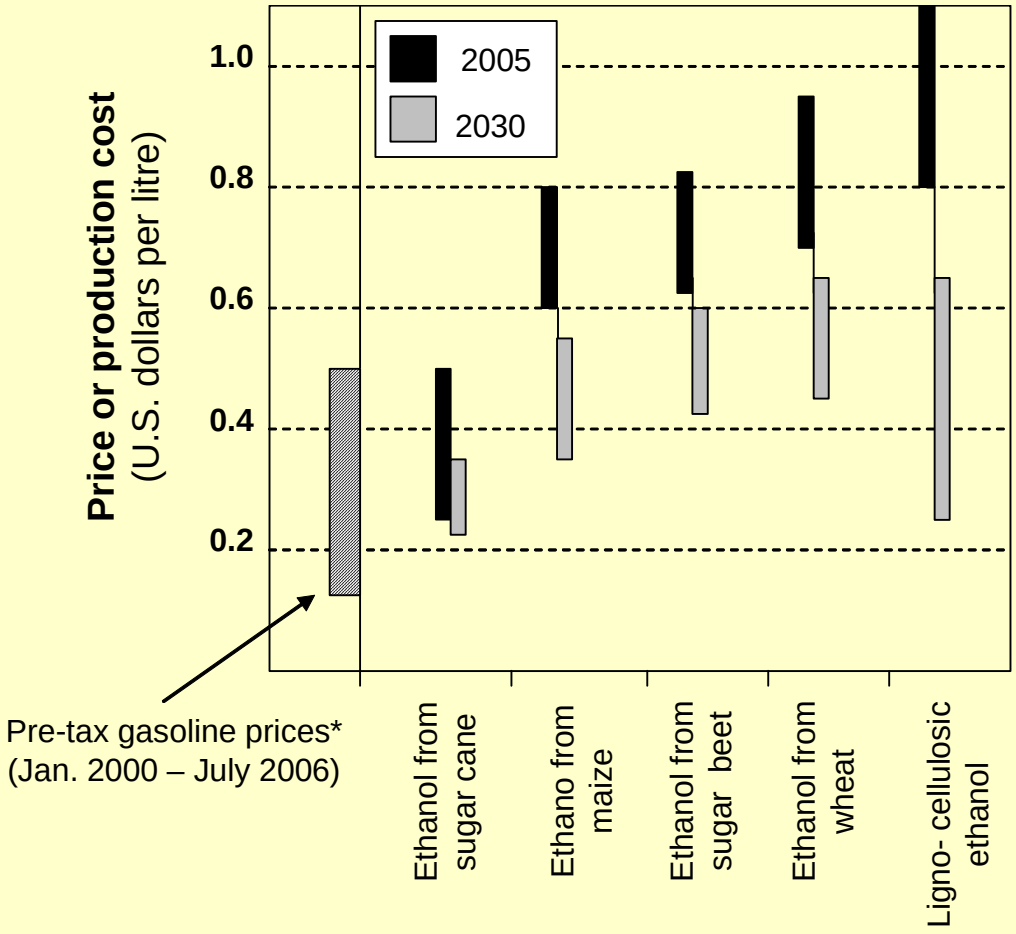
Current and expected future costs of ethanol



Source: IEA, *World Energy Outlook 2006*.

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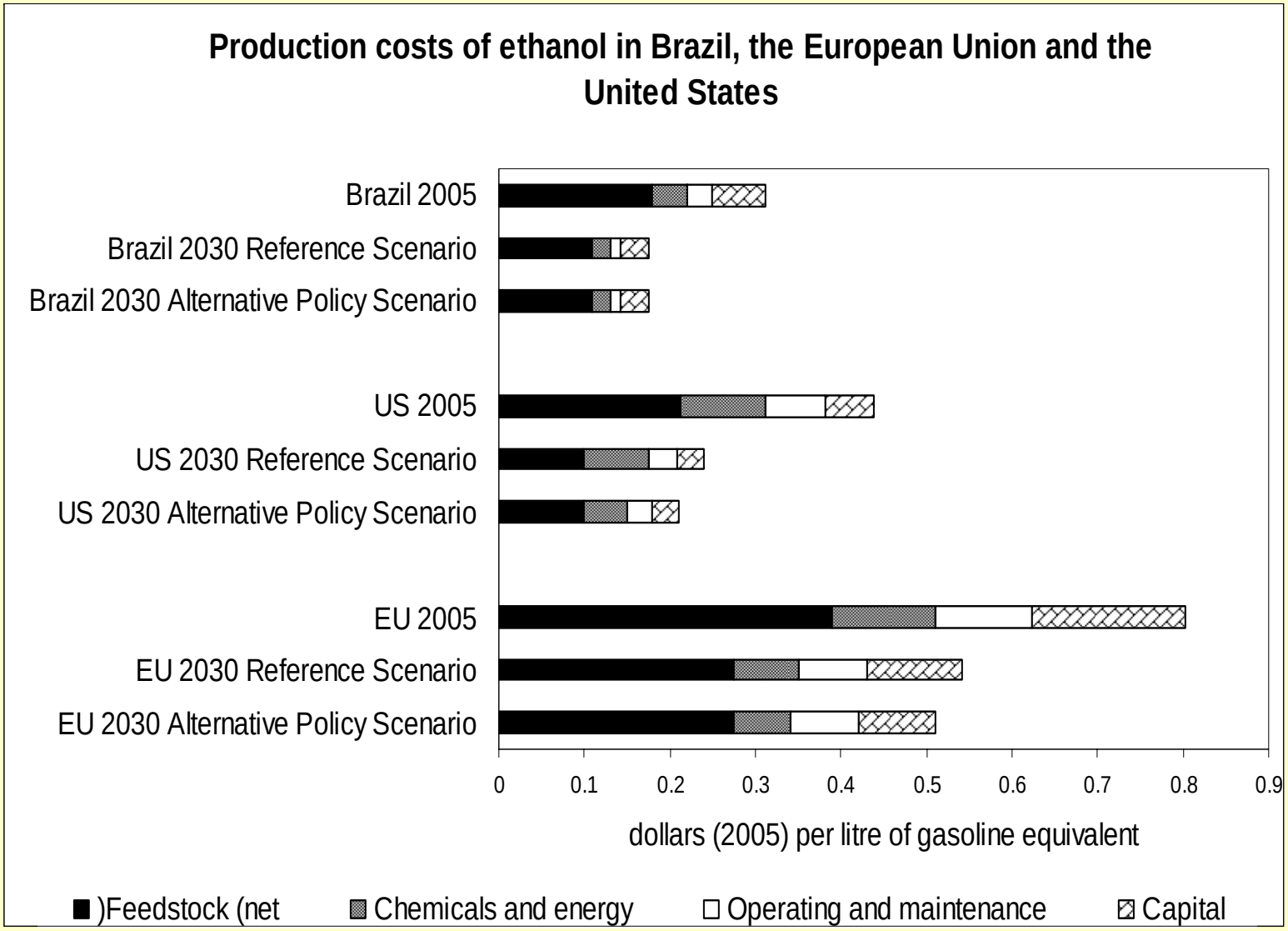
Production costs of ethanol in Brazil, the European Union and the United States



Source: IEA, *World Energy Outlook 2006*.

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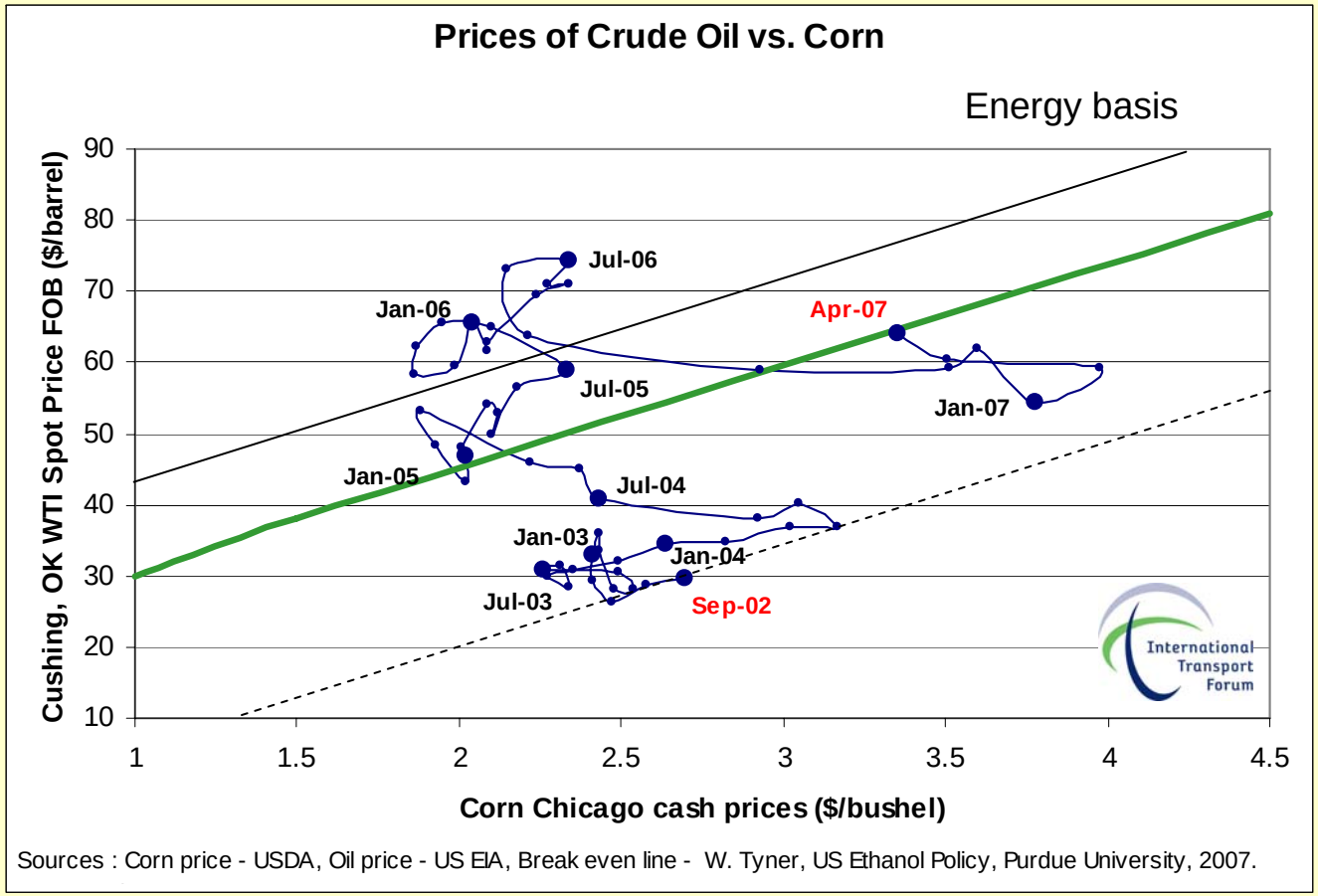
The U.S. Ethanol Boom



Price premium only

Price premium and subsidy

Source: Courtesy of Steven Perkins, European Conference of Ministers of Transport..

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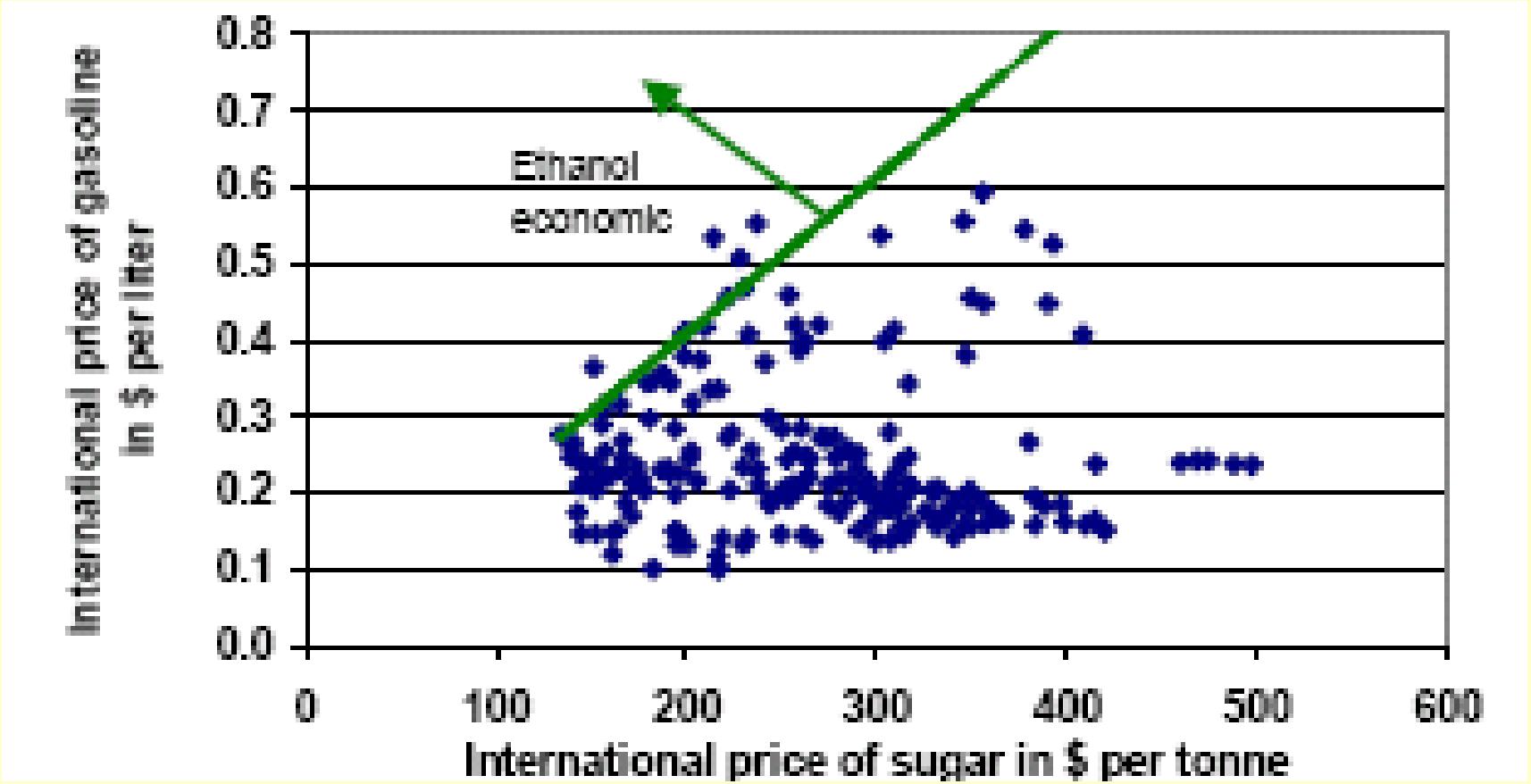
Comparative economics of sugar versus ethanol sale, Jan. 1990-present (2007 US$)



Sources: Masami Kojima, et al. (2007)

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Reference international commodity prices for sugar, maize and wheat, 2005-2007

Commodity	Average price for 2005 (USD/tonne)	Peak price since May 2005 (USD/tonne and week ending)	Average price, 1 January 2007 through 1 May 2007 (USD/tonne)	Percentage change, nominal terms, avg. 2005 to mid-May 2007
Sugar[1]	$218	$406 (*03.02.06*)	$231	**6%**
Maize[2]	$109	$203 (*23.02.07*)	$183	**68%**
Wheat[3]	$150	$229 (*20.10.06*)	$191	**27%**

1. Based on weekly averages of International Sugar Organization (ISO) daily price, expressed in US cents per pound.
2. US No.2, Yellow, price at U.S. Gulf ports (Friday quotations), expressed in USD per short ton.
3. US No.2, Soft Red Winter Wheat , price at U.S. Gulf ports (Tuesday quotations).

Source: Data from Food and Agricultural Organization of the United Nations, "International Commodity Prices" website (www.fao.org/es/esc/prices), accessed on 22 May 2007.

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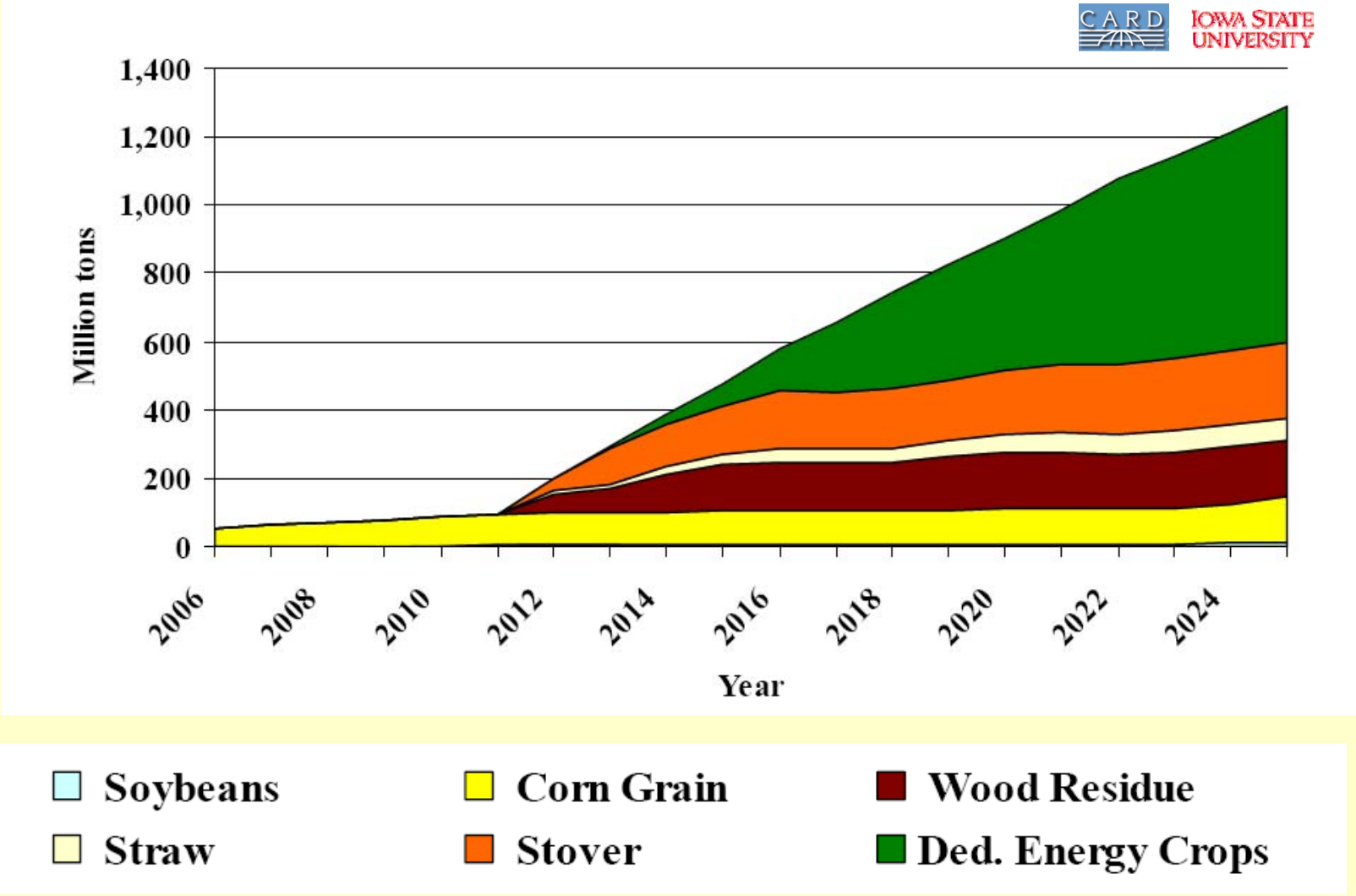
One view of the potential outlook for U.S. Biomass



Source: U. of Tennessee, "25% Renewable Energy for the U.S. by 2025", Report, November 2006

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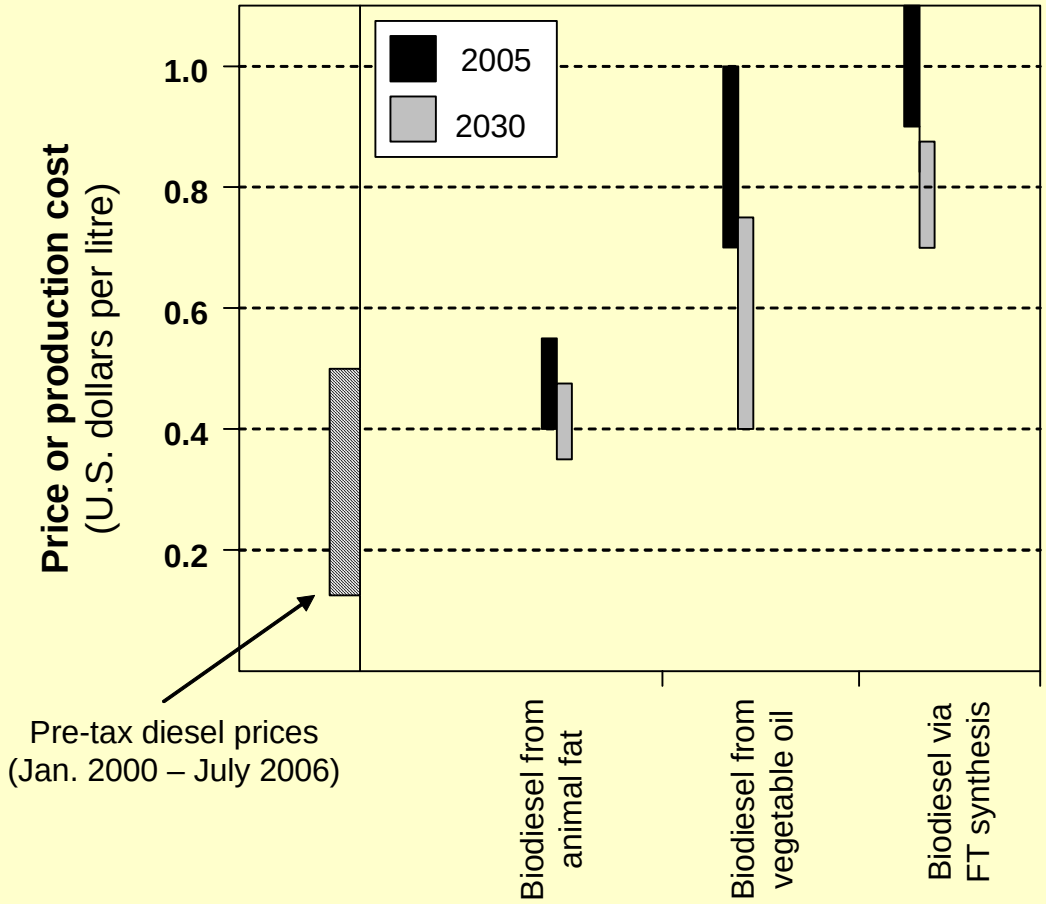
Current and expected future costs of biodiesel



Source: IEA, *World Energy Outlook 2006*.

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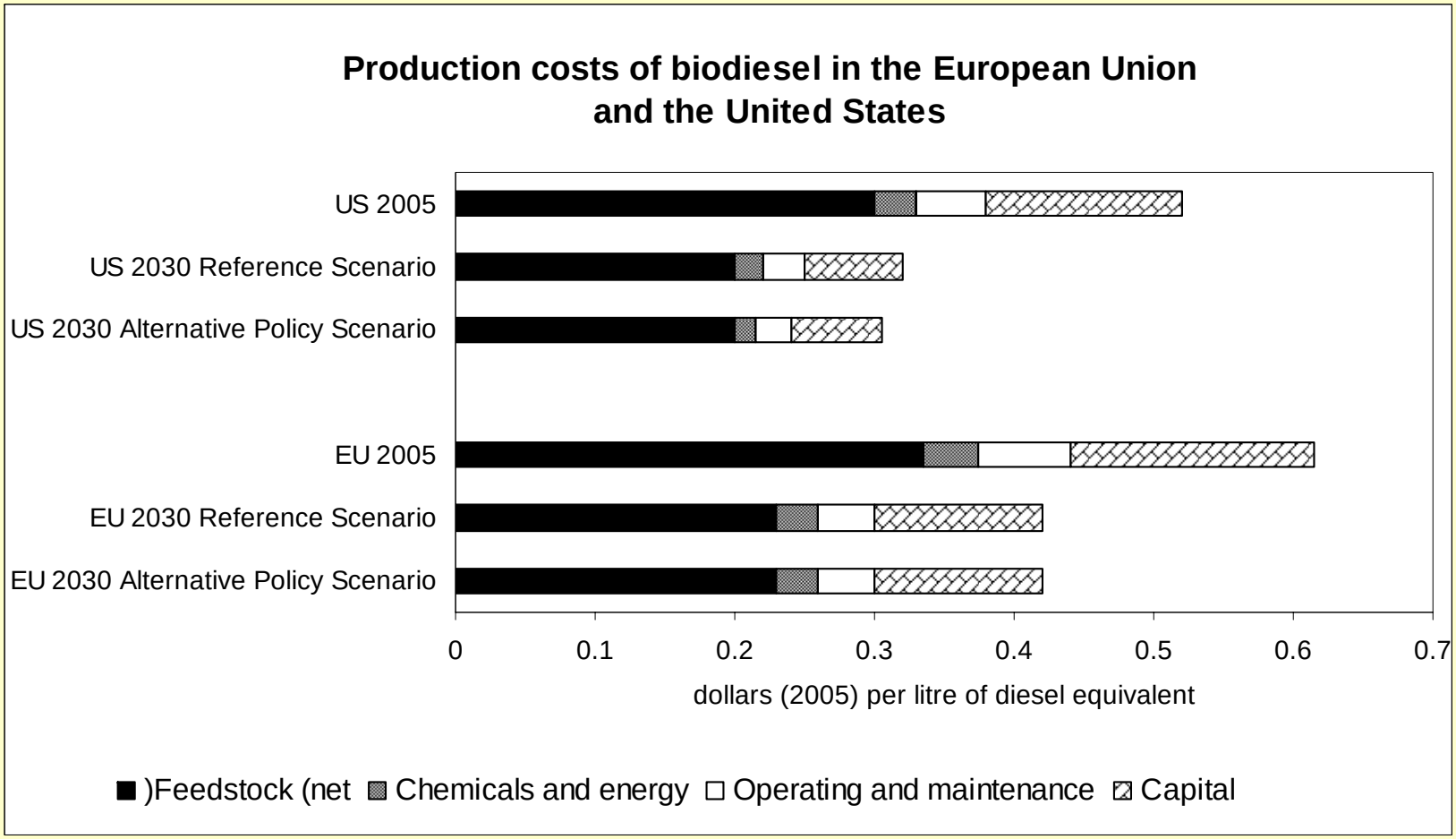

Source: IEA, *World Energy Outlook 2006*.

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Reference international commodity prices for rapeseed oil, soybean oil and crude palm oil, 2005-2007

Commodity	Average price for 2005 (USD/tonne)	Peak price since May 2005 (USD/tonne and month)	Average price, January-February 2007 (USD/tonne)	Percentage change, nominal terms, 2005 avg. to 2007 to date
Rapeseed oil[1]	$669	$856 (*12.06*)	$800	**19%**
Soybean oil[2]	$545	$714 (*02.07*)	$706	**29%**
Crude palm oil[3]	$422	$605 (*02.07*)	$602	**43%**

1. Monthly averages of ex-mill price (f.o.b.), Netherlands.
2. Monthly averages of ex-mill price (f.o.b.), Netherlands.
3. Monthly averages of import price (c.i.f.), north-west Europe.

Source: Data from Food and Agricultural Organization of the United Nations, "International Commodity Prices" website (www.fao.org/es/esc/prices), accessed on 22 May 2007.

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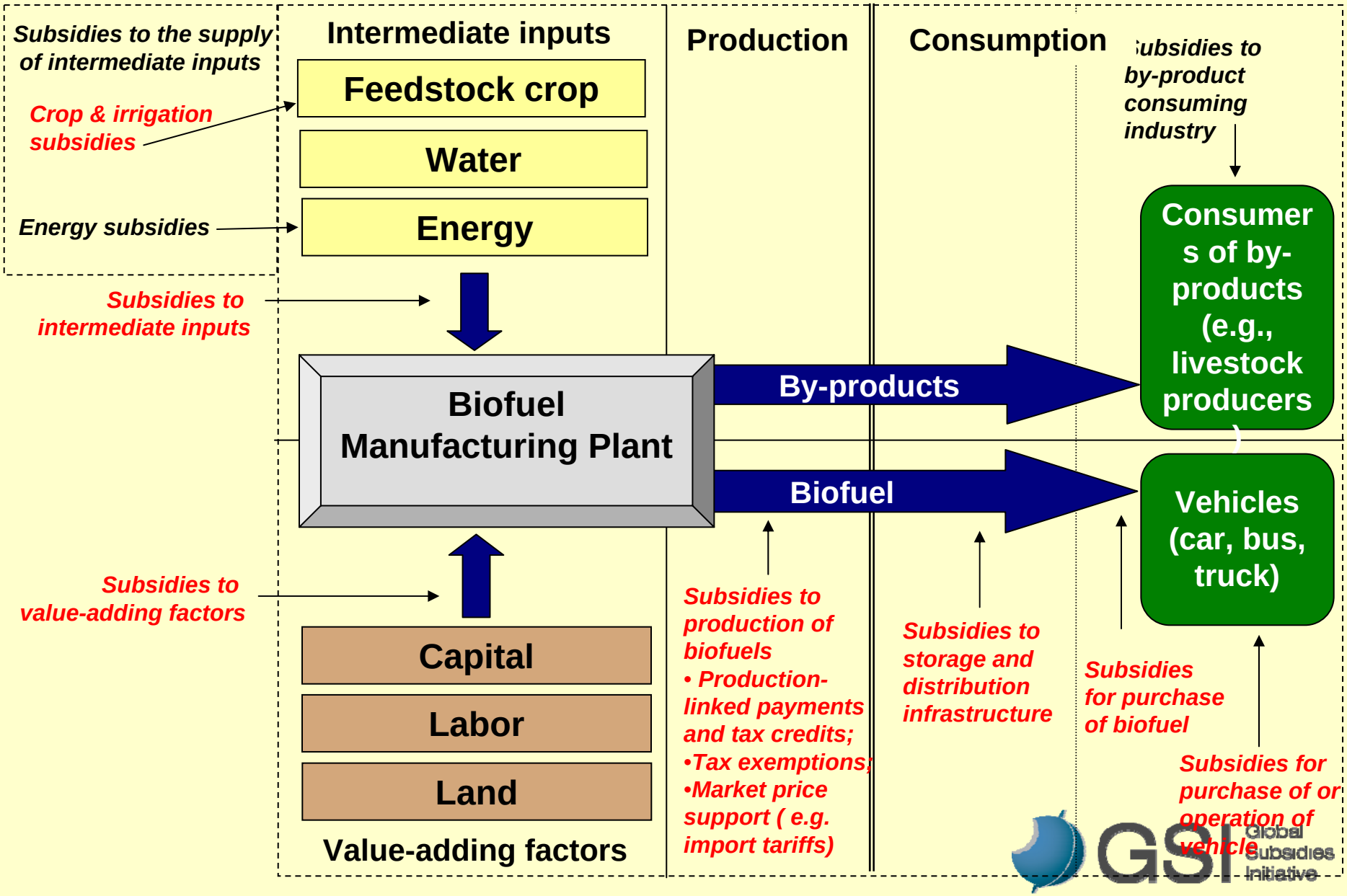
Intervention points



International comparison of ethanol incentives (euro cents/litre)

Country	Production incentive	Reduced excise tax	Import tariff (MFN)[1]	Exceptions from tariff
Australia	—	**28.9 ¢** Value of rebate on excise tax	**28.9 ¢** Effective rate because excise tax not rebated	None
Brazil	—	**¢** (Sao Paulo)	—	Mercosur
Canada	up to **16.4¢** (variable rate, QB)	up to **15.1¢** (BC)	**4.3¢**	NAFTA, CAFTA, Chile
EU	—	up to **70.9¢** (Ger)	**24.1¢**	EFTA, GSP (not incl. Brazil)
Switzerland	—	**57.8¢**	**27.7¢**	EU, GSP (incl. Brazil)
USA	**13.5¢ + state**	**up to 8.4¢ (MO)**	**2.5% + 14.3¢**	NAFTA, CBI

1. Undenatured ethyl alcohol for use as a fuel.

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USA: aggregate support and subsidy intensity

Subsidies to ethanol and biodiesel: total and per gasoline or diesel gallon equivalent

	Units	Ethanol		Biodiesel	
		Low	High	Low	High
Total support					
Estimate for 2006	$ billions	5.1	6.8	0.4	0.5
Annualized estimate, 2006-2012	$ billions	6.3	8.7	1.7	2.3
Subsidy per gallon gasoline (gge) or diesel (gde) equivalent					
Estimate for 2006	$/gge or $/gde	1.42	1.87	1.69	2.15
Annualized estimate, 2006-2012	$/gge or $/gde	1.44	1.96	1.24	1.70

Source: Doug Koplow, *Biofuels — At What Cost?: Government Support for Ethanol and Biodiesel in the United States*, Geneva: Global Subsidies Initiative of the International Institute for Sustainable Development, October 2006.

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Cost-effectiveness of U.S. support policies, estimates for 2006

		Ethanol		Biodiesel		Cellulosic ethanol (hypothetical case)[1]	
	Units	Low	High	Low	High	Low	High
Subsidy per net litre of liquid petroleum fuels displaced (assuming 32.5 or 35.6 MJ/litre)	$/litre equiv.	0.49	0.52	14.60	18.60	0.34	0.43
Subsidy per net GJ of fossil fuels displaced	$/GJ	30.90	41.00	27.20	34.70	10.70	13.40
Subsidy per metric ton of CO2-equivalent emission reduced	$/tonne	520	NA	NQ	NQ	118	147

Source: Doug Koplow, *Biofuels — At What Cost?: Government Support for Ethanol and Biodiesel in the United States*, Geneva: Global Subsidies Initiative of the International Institute for Sustainable Development, October 2006.

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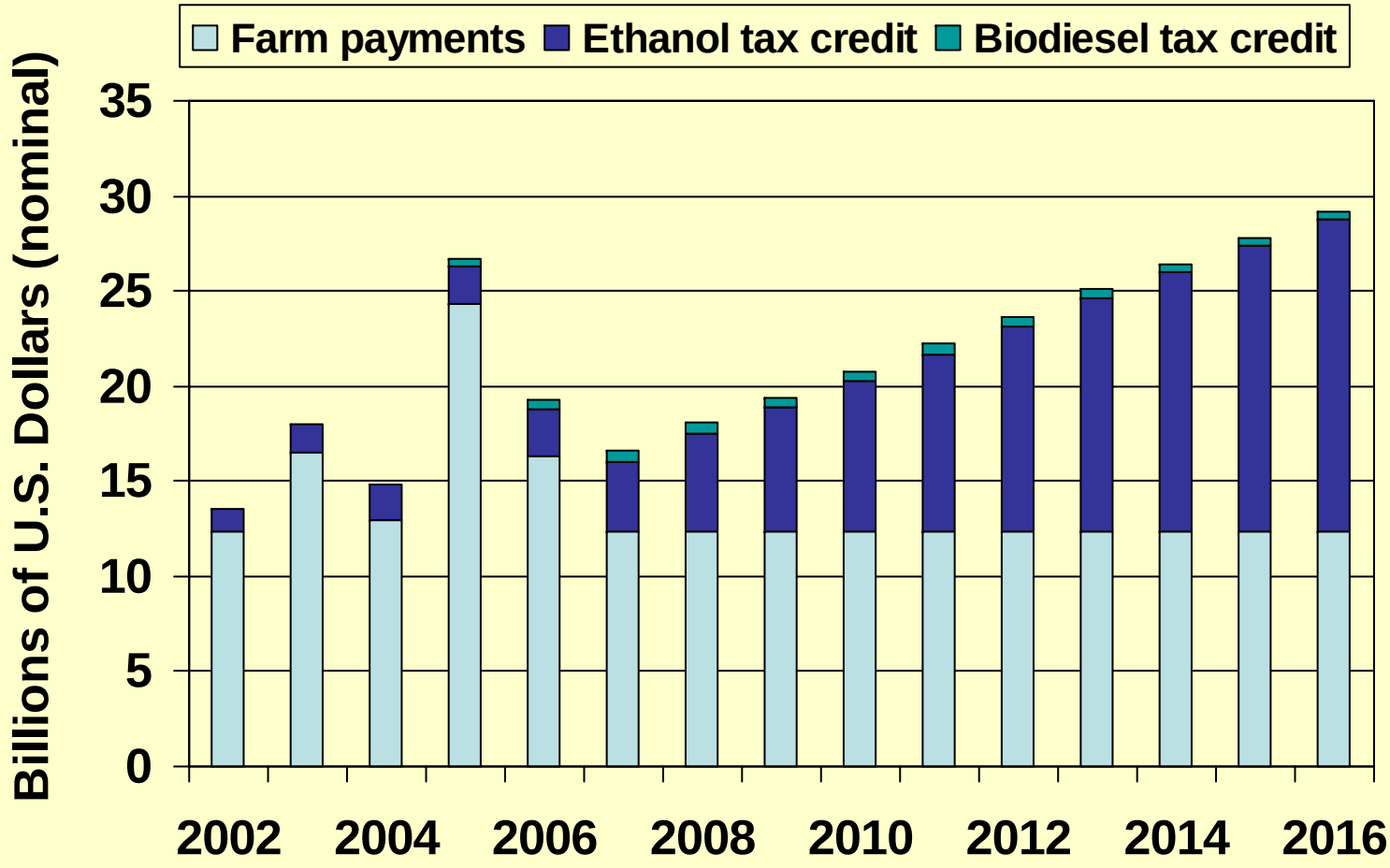
Total of farm payments and biofuel subsidies in the United States: 2002-2016



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Thank you

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