



The Government of Israel
Prime Minister's Office

The Israel Alternative Fuels Initiative

***Reducing World Dependence on
Oil in Transportation***

Eyal Rosner

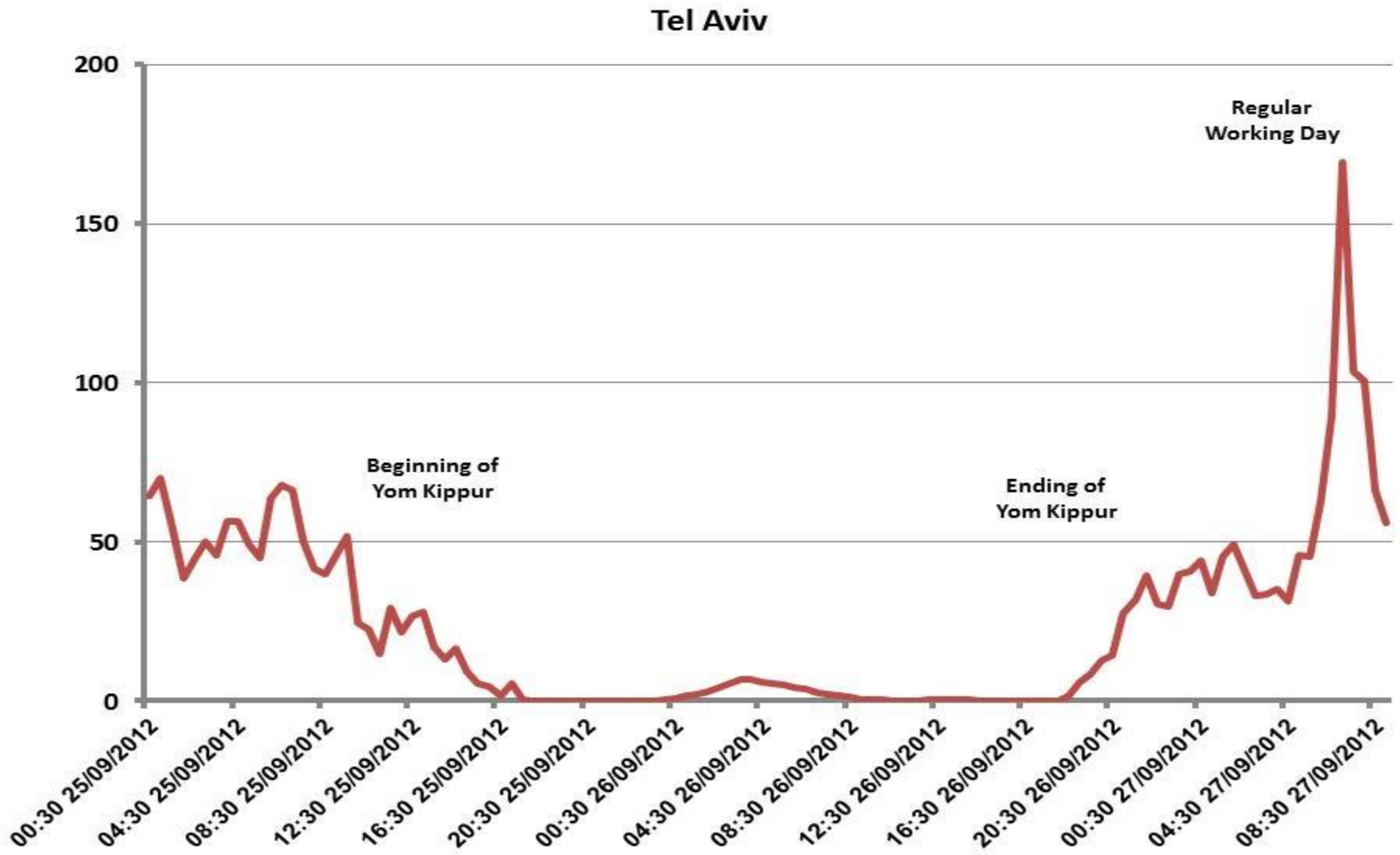
***Chairman of the National Program for the Development
of Alternative Fuels in Transportation***



What we will discuss:

- *The importance of finding alternative solutions*
- *The state of oil substitutes*
- *Strategy*
- *Israeli government activities*

NOx Emission – Tel Aviv, Yom Kippur 2012



Why must we find substitutes for oil ?

Oil Has a Monopoly in Transportation



Oil Reserves Peaking



Economic Effects



Environmental Problems



The Israel Alternative Fuels Initiative

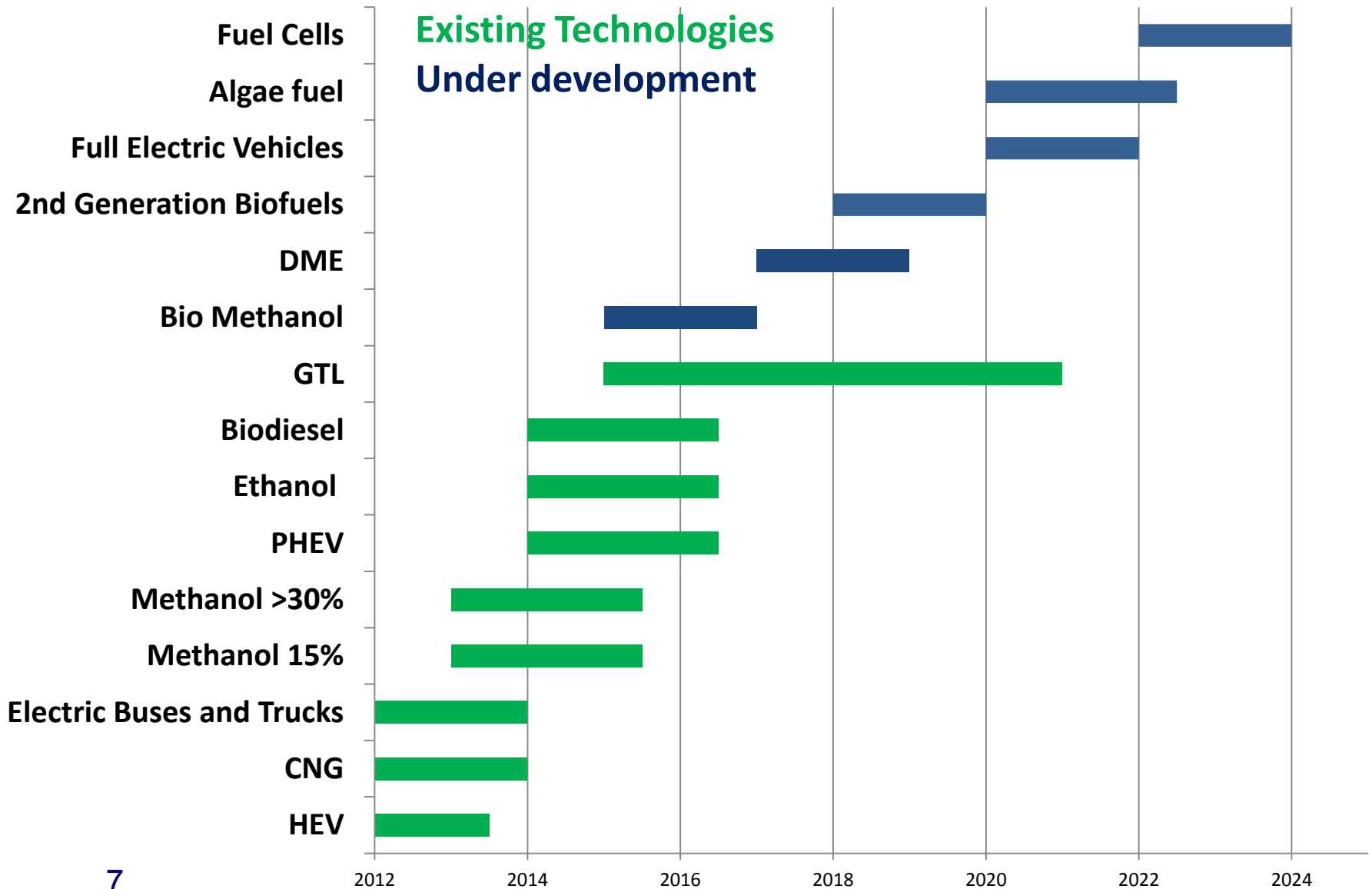
Our Mission:

To serve as a catalyst for the reduction of global dependence on crude oil by establishing Israel as a center of knowledge and industry in the field of fuel alternatives for transportation.

Basic assumptions

- *Solutions must have economic viability*
- *We will not pick a winner*
- *We will provide equal opportunity for everyone*
- *Infrastructure will need government support*

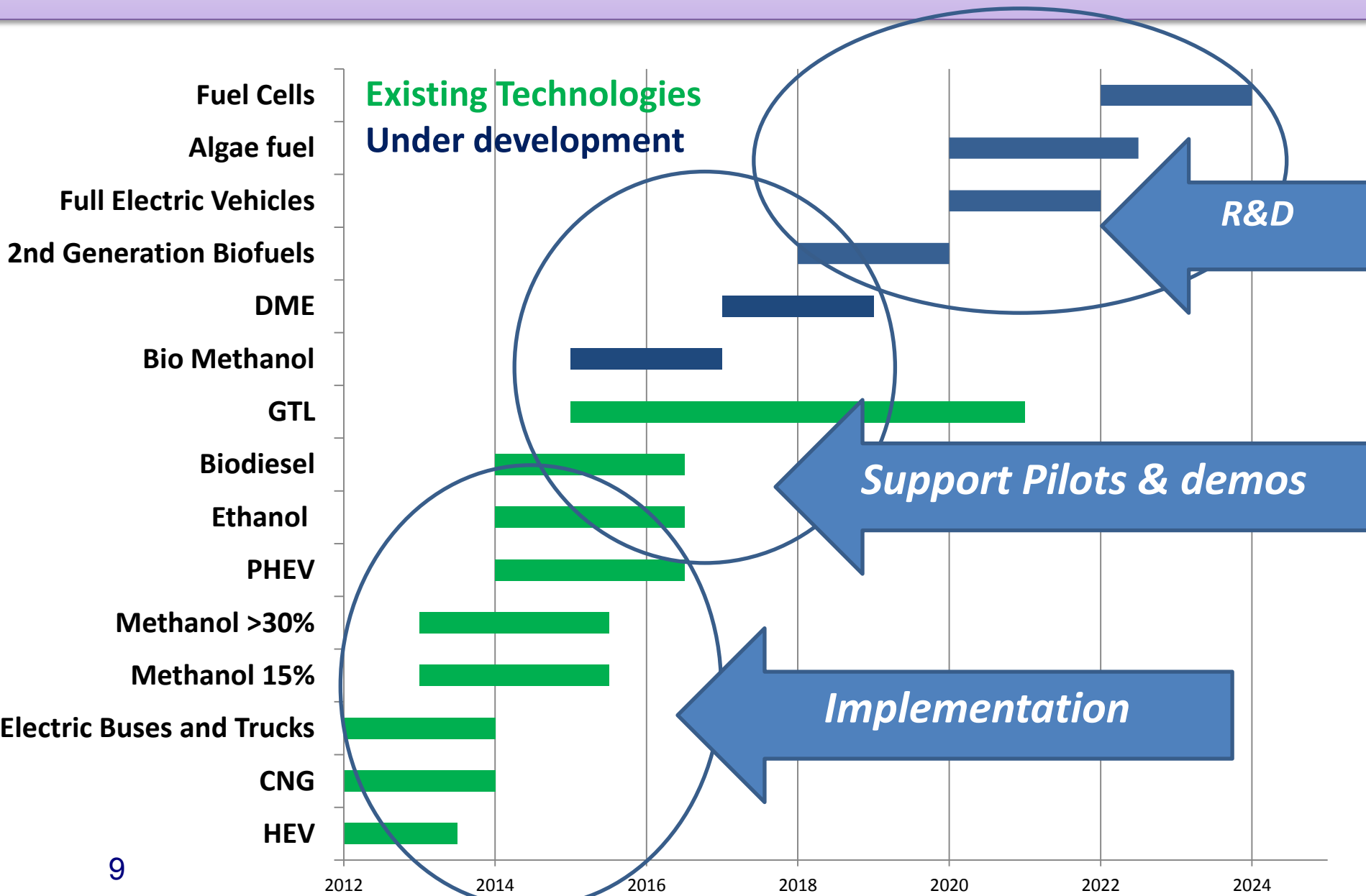
Forecast of economic viability of Technologies



Reality of Fuels Alternatives

- *There are many solutions*
- *No gold standard*
- *Some solutions are already economically viable*
- *Solutions are locally based*
- *Implementation can start now*

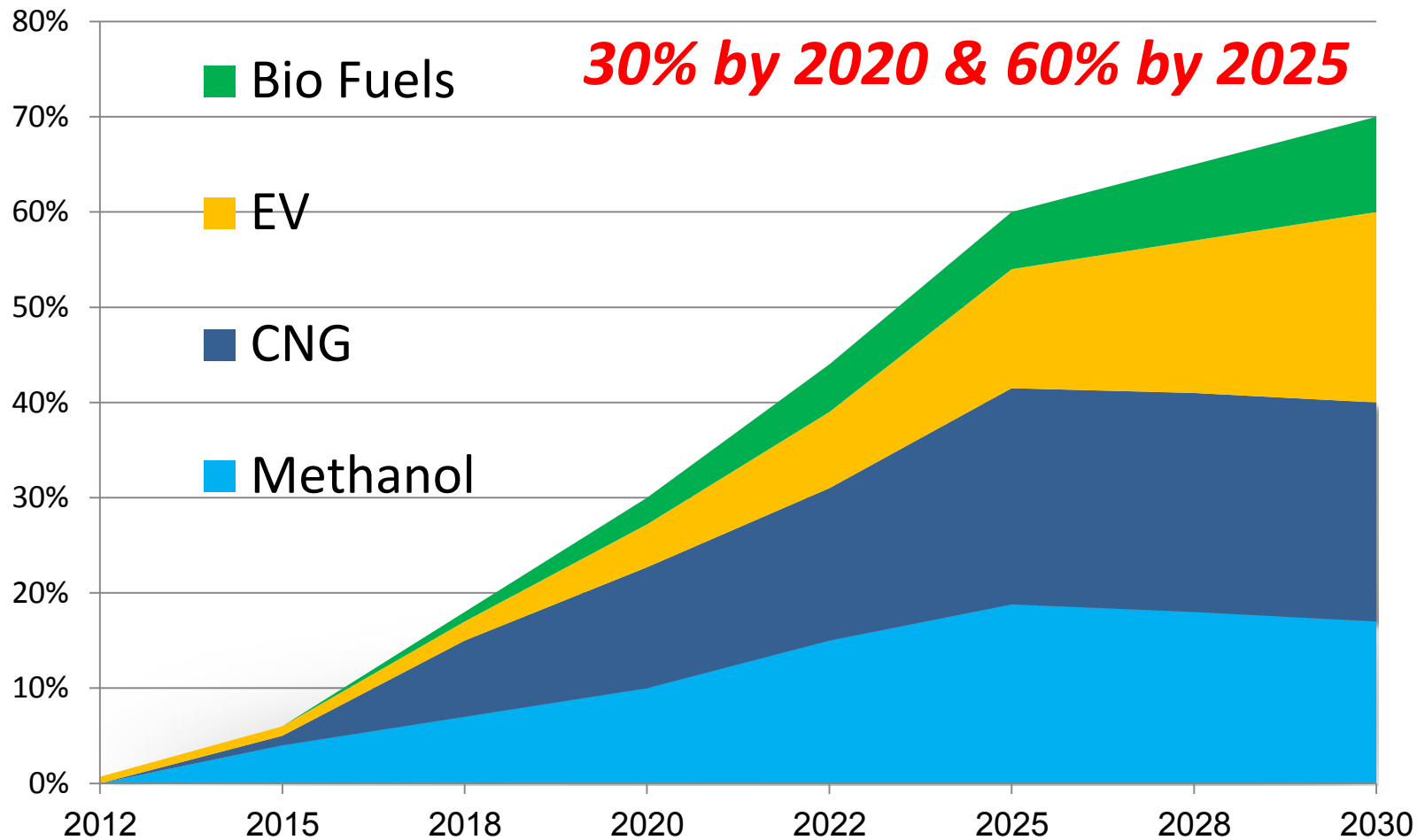
Market Needs



Strategy

1. Reduce the share of oil in Israel's transportation sector by **30% by 2020** and by **60% by 2025**, while supporting green growth and becoming a show case to the world.
2. Turn Israel into a center of knowledge and industrial best practices in the field of fuel alternatives.
3. Raising the world's awareness of alternative fuels. Building global coalition of partners to speed up innovation.

Expected Penetration Rate for Transportation Fuel Alternatives in Israel



Goal # 2: Center of Knowledge and Best Practice

The role of the government is to build an ecosystem by:

- ***Aligning all government offices to set long term policies:***
tax, incentives and regulations
Unified regulation processes to encourage pilots, demos
- ***Support research and innovation***
- ***Build local knowledge – Pilots, Seminars and international collaborations***

Goal # 2: Government Activity:

- ✓ *One Stop Center*
- ✓ *Academic centers + grants*
- ✓ *Clusters of academia-industry*
- ✓ *Pilots and test bed*
- ✓ *Unified regulation process*
- ✓ *Chief Scientist + Co-investment fund*
- ✓ *New Global Prize*
- ✓ *Seminars*
- ✓ *Bilateral agreements*

Goal # 3: Spread the vision and build global partnerships

Raising the world's awareness to fuel choices, and to Israel's policy in the field.

Invite potential partners to take part in the local activities in this field

Establishing global network of partners to support innovation in alternative fuels.

Energy Storage Technologies

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- *Challenge: improved energy storage and integration into mobility platforms*
- *Israel is home to innovative electrochemistry and energy storage applications & research (INREP).*
- *Applied research and production is focused on:*
 - *Hydrogen Storage Systems*
 - *Metal Air Batteries*
 - *Battery Management Systems*
 - *Lithium Batteries*
 - *Super Capacitors*
 - *Fuel Cells*

*Energy Storage
and EV
conference
(May 31st 2013)*

*Ecomotion
(May 8th 2013)*

Energy Agriculture

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- *Challenge: feedstock production*
- *Israel is a global leader in agro-technology*
 - *Advanced Energy Agriculture Projects, based on leading Israeli agro-companies*
 - *Castor bean farming and industrial processes for biofuels and "green chemistry"*
 - *Algae farming for the food industry and as feedstock for biofuels*
 - *Bio-Fuel production processes and technologies*
 - *R&D is focused on:*
 - *New varieties of energy plants*
 - *New machinery for harvest of new crops*
 - *Procedures for post harvest processes and production of bio-fuels*
 - *Development of other new local technologies*

Agro-Energy
Projects Global
Conference
(Nov 2013)

Natural Gas for Transportation

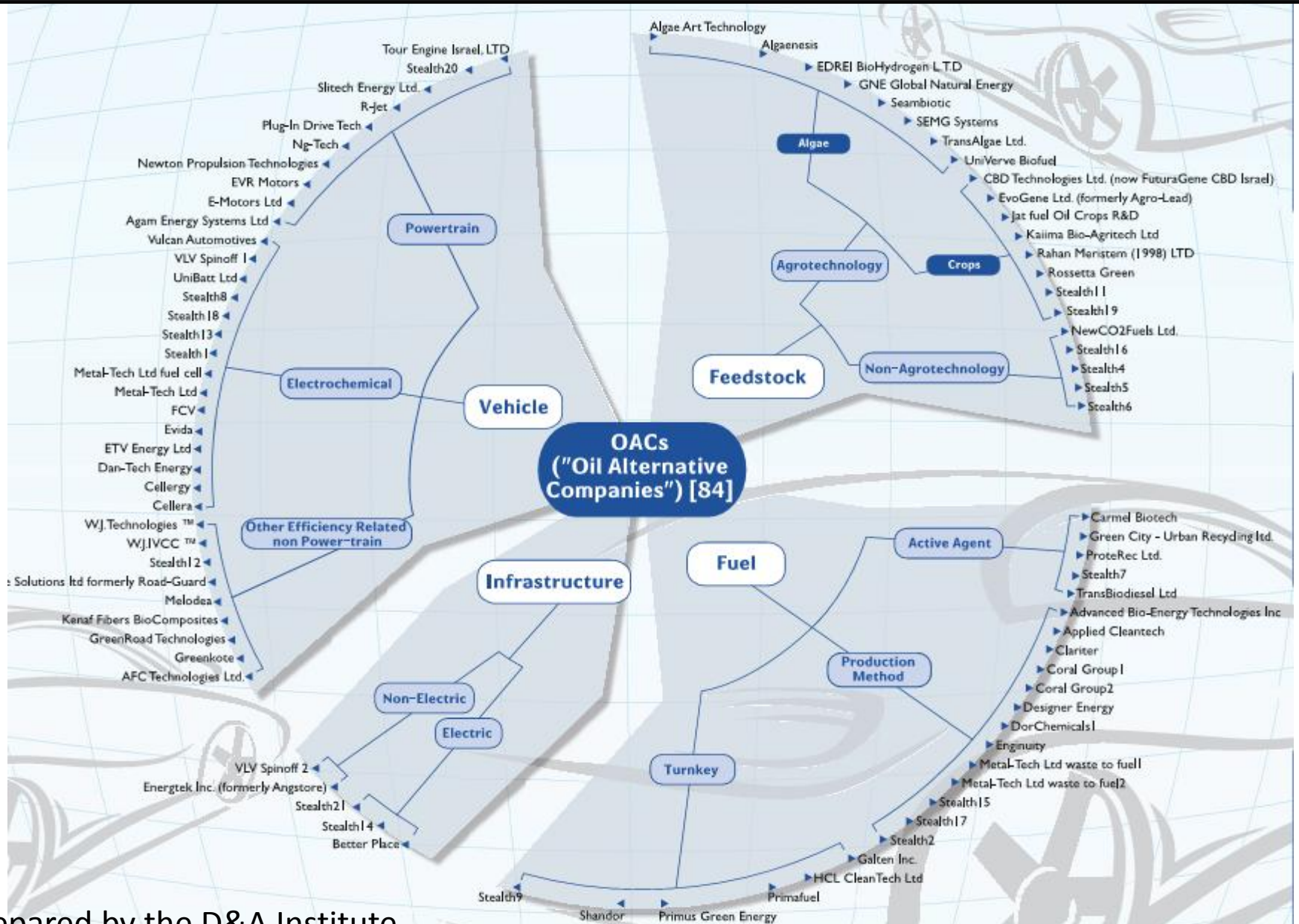
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- *Natural gas is the best short term solution for replacing oil in the transportation and as a bridge towards fully sustainable energy solutions.*
- *NG based transportation in the Israeli market is focused on:*
 - *Concentrated Natural Gas (CNG) solutions for trucks, light duty vehicles, buses and private vehicles*
 - *Methanol as a gasoline blend, mainly to be used by private vehicles.*
 - *Gas to liquid technologies, that can turn natural gas into drop-in fuels*

*eBuses and
CNG trucks
workshop
(January 2013)*

*Israel
Transportation
Conference
(June 2013)*

Investment Fields and Active Companies



*Prepared by the D&A Institute

General Conferences and Events

Conferences:

- *Global Summit - Oct. 13*
- *Rotterdam – Mar. 13*
- *EV and Batteries – May 13*
- *Transportation – Jun. 13*
- *Agro-Energy – Nov. 13*
- *Investments Conferences
(London / NY / China)*

Events:

- *NG & e-Buses Seminar*
- *Scientific Delegation to US
national labs –Apr. 13*
- *German / France / China
Delegations*

Global Challenge
Local Research and Innovation
International Collaboration



THANK YOU

The End of the “Cheap Oil” Era

In 1900, the “price” of harvesting 100 barrels of oil was 1 barrel

Today one barrel of oil nets only three to five in return



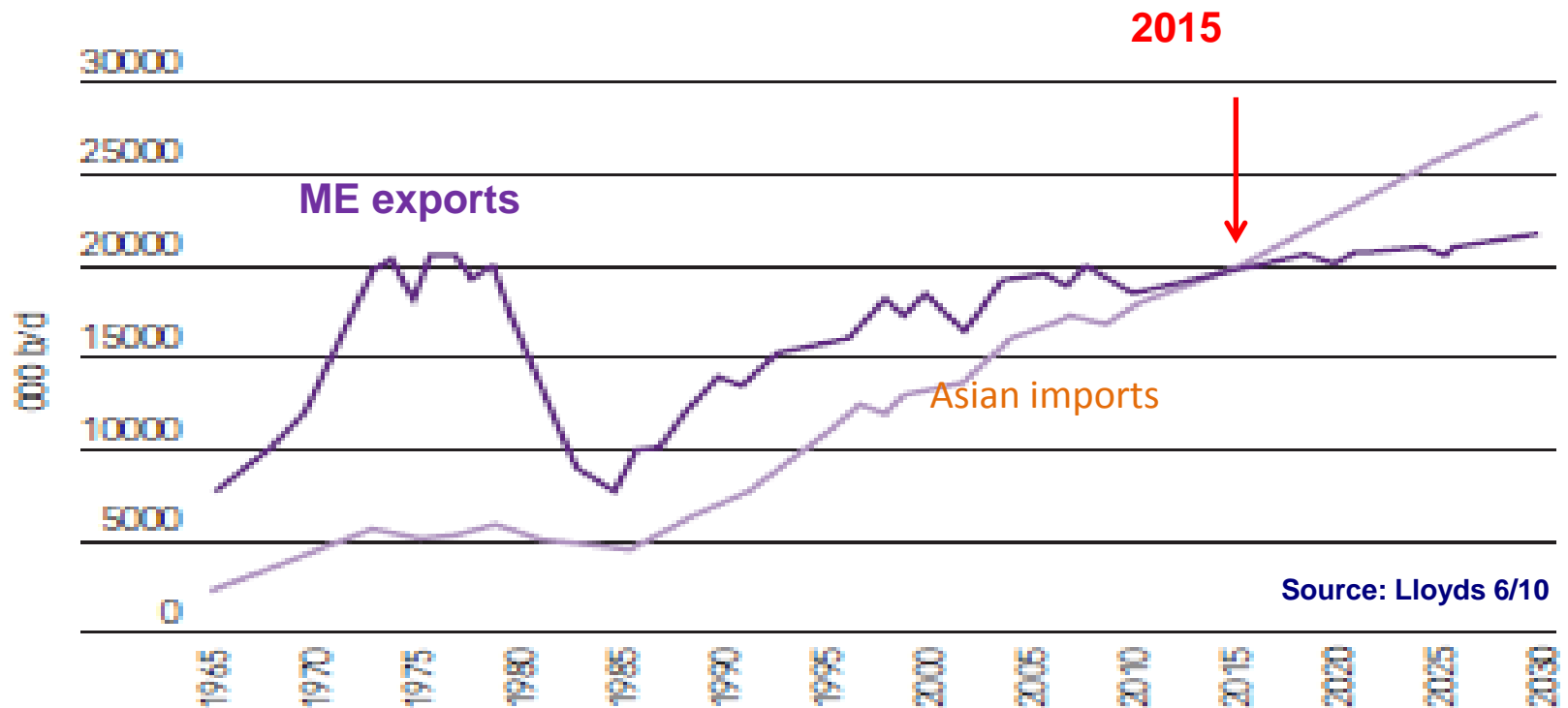
Even if we find more oil - it's not going to be cheap



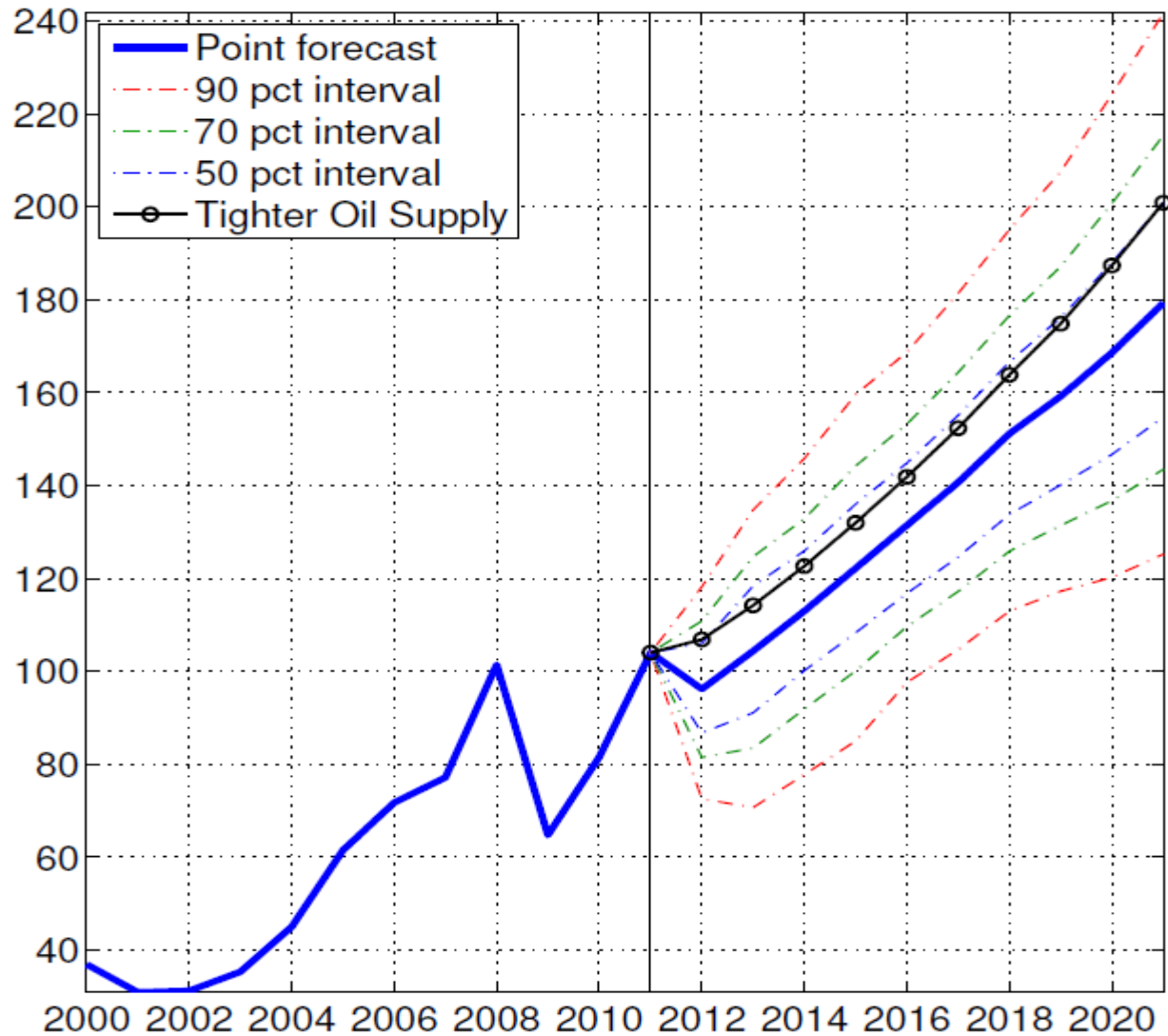
Increasing Global Oil Dependence

- Global dependence on oil is due to transportation
 - Around 1 billion new cars will be sold by 2020
- Asia's increasing dependence on oil from the Persian Gulf

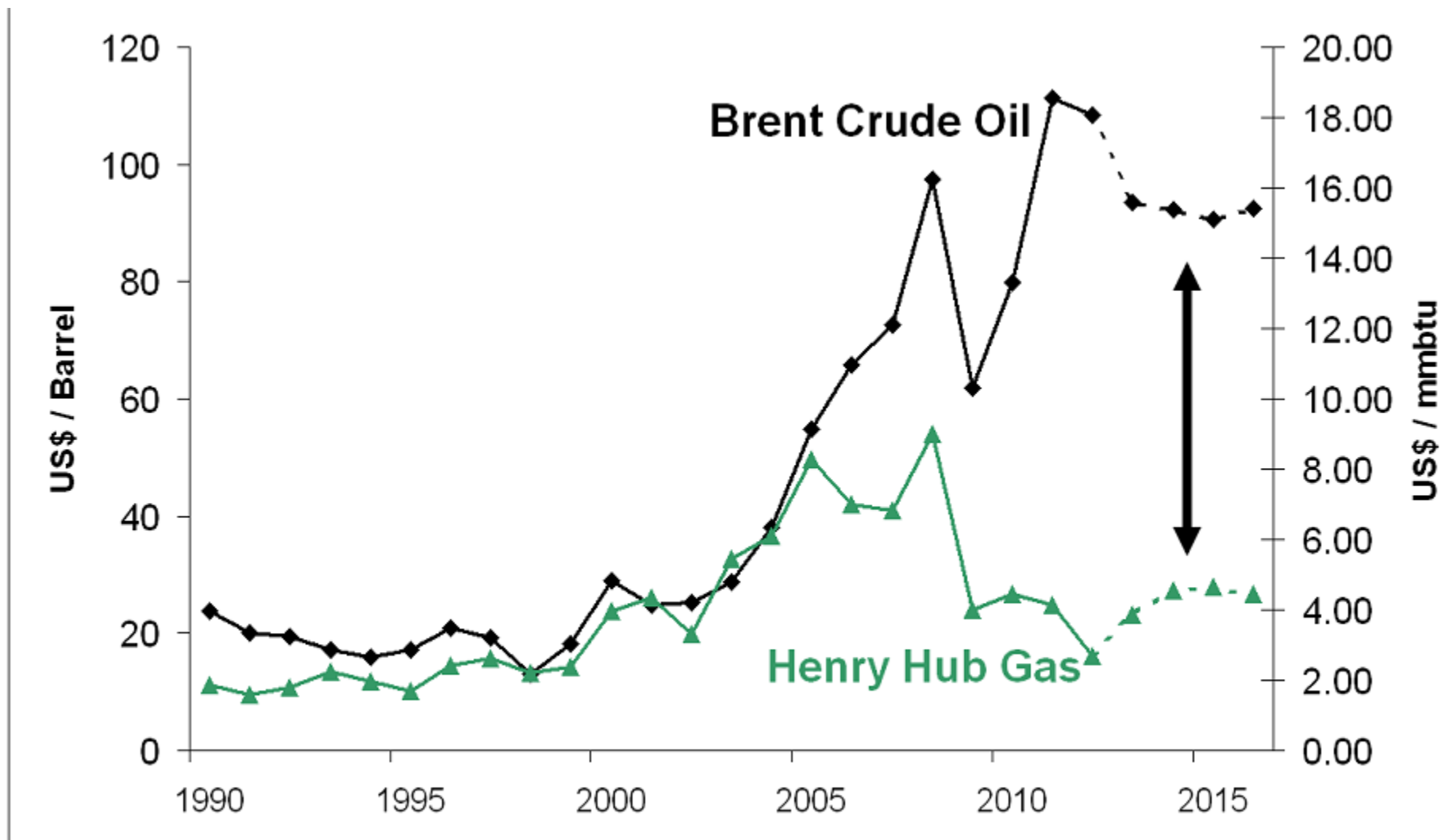
Asian oil demand VS Middle East surplus



Oil price projection (IMF)



Natural Gas vs. Brent Crude Oil



Source: CMAI, August 2012



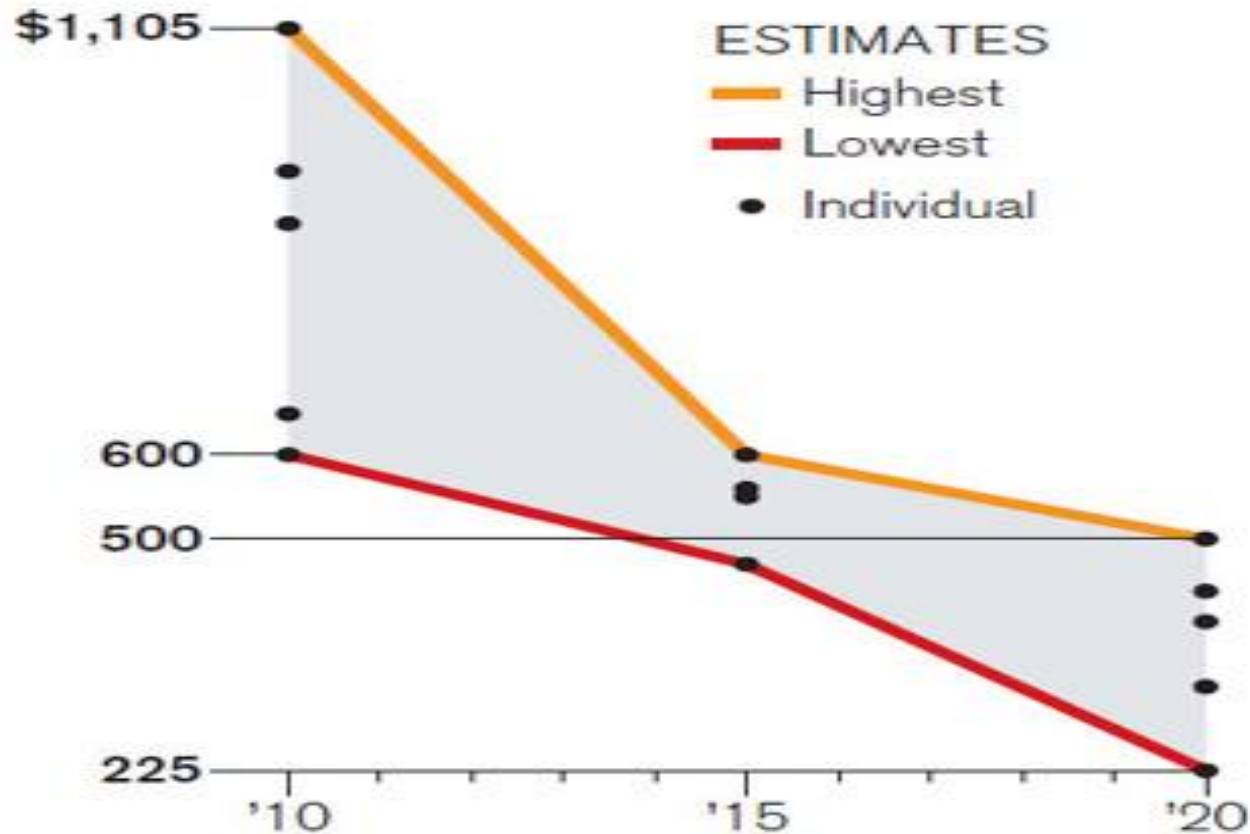
Available technologies in use around the world

	Technology	Major Countries
1	Biodiesel	US, EU,
2	Ethanol	Brazil, US, EU
3	Methanol	China
4	CNG Trucks	US, EU
5	CNG Buses	US, EU
6	EV	Globally
7	HEV	Globally
8	PHEV	Globally
9	eBuses	China, EU
10	eTrucks	US
11	GTL	S. Africa



Estimates of EV battery cost

Estimates of electric-vehicle battery costs
\$ per kilowatt-hour



Sources: *Advanced Automotive Batteries, Boston Consulting Group, Deutsche Bank, Electrification Coalition, National Research Council, and Pike Research*



Israeli market - Penetration Analysis



	<i>Gasoline</i>	<i>Diesel</i>				<i>Jet Fuel</i>	<i>Diesel</i>
	<i>Mainly Private Vehicles</i>	<i>Light Duty Trucks</i>	<i>Medium & Heavy Duty Trucks</i>	<i>Buses</i>	<i>Private Vehicles & Taxis</i>	<i>Jet Planes</i>	<i>Train</i>
Current Usage	100%	32%	40%	18%	10%	100%	100%
2020 Objective	69%	22%	24%	12%	7%	95%	15%
		65%					
Total		70%					
2025 Objective	40%	10%	12%	5%	3%	80%	15%
		29%					
Total		40%					

Growth – Contribution to the GDP

