New forces at work in global energy supply and demand:

underlying assumptions and possible futures

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Contents

1. Assumptions

2. Recent trends

3. Possible futures

Contents

	Known	Unknown
Known		
Unknown		

	Known	Unknown
Known	**What we know**	**What we know we don’t know**
Unknown	**What we <u>think</u> we know**	**What we don’t know and cannot aspire to know in advance**

	Known	Unknown
Known	• **Sufficient oil and gas** reserves to meet demand • **Demand is not where supply is** found –for the most part	
Unknown		

	Known	Unknown
Known		
Unknown	• **Asian energy demand** will continue to grow faster than the rest of the world's demand • **OECD energy demand** remains flat • Germany is not going back to **nuclear** and Japan is going back, but not completely • **North American oil and gas output** is profitable, flexible, and safe for the environment	

	Known	Unknown
Known		• **Government policy** ○ Energy efficiency ○ Environment • **Technological change** ○ Transportation ○ Power generation • **Geopolitical developments**
Unknown		

	Known	Unknown

Known	• **Sufficient oil and gas** reserves to meet demand
	• **Demand is not where supply is** found –for the most part
		• **Government policy**
		  ○ Energy efficiency
		  ○ Environment
		• **Technological change**
		  ○ Transportation
		  ○ Power generation
		• **Geopolitical developments**

Unknown	• **Asian energy demand** will continue to grow faster than the rest of the world's demand • **OECD energy demand** remains flat • Germany is not going back to **nuclear** and Japan is going back, but not completely • **North American oil and gas output** is profitable and safe for the environment	

Are you sure?

Why?

Contents

1. Assumptions

2. Recent trends

3. Possible futures

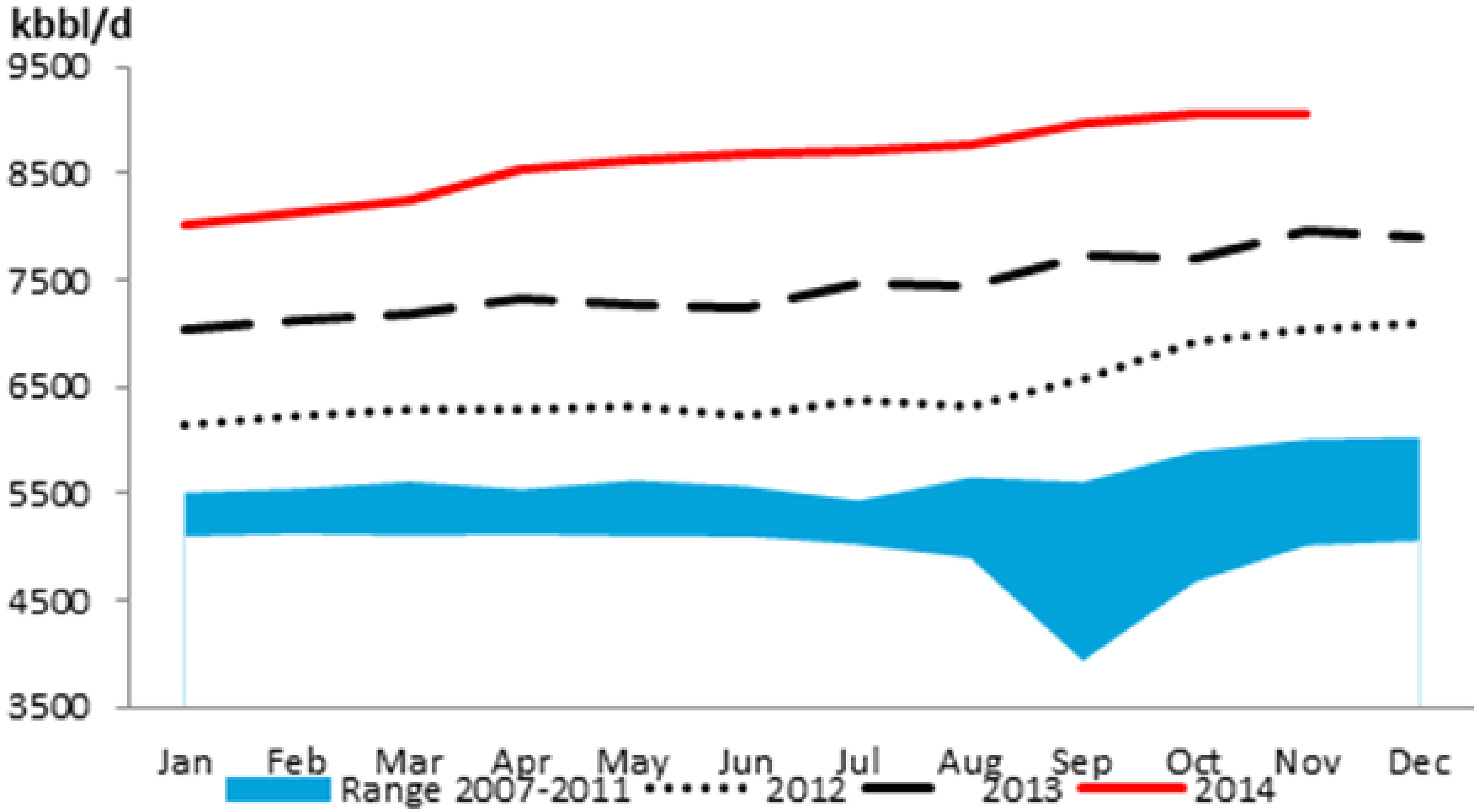
Demand: 7 of the 10 countries with the largest oil product demand declines in 2014 were from the **OECD**, which accounted for **1.2 mb/d**

Kb/d

1	**Japan**	**-592.7**
2	**Netherlands**	**-189.2**
3	**Nigeria**	**-146.0**
4	**France**	**-108.6**
5	**Canada**	**-106.1**
6	**China**	**-103.0**
7	**Germany**	**-89.7**
8	**Chinese Taipei**	**-77.4**
9	**Korea**	**-73.7**
10	**United Kingdom**	**-66.3**

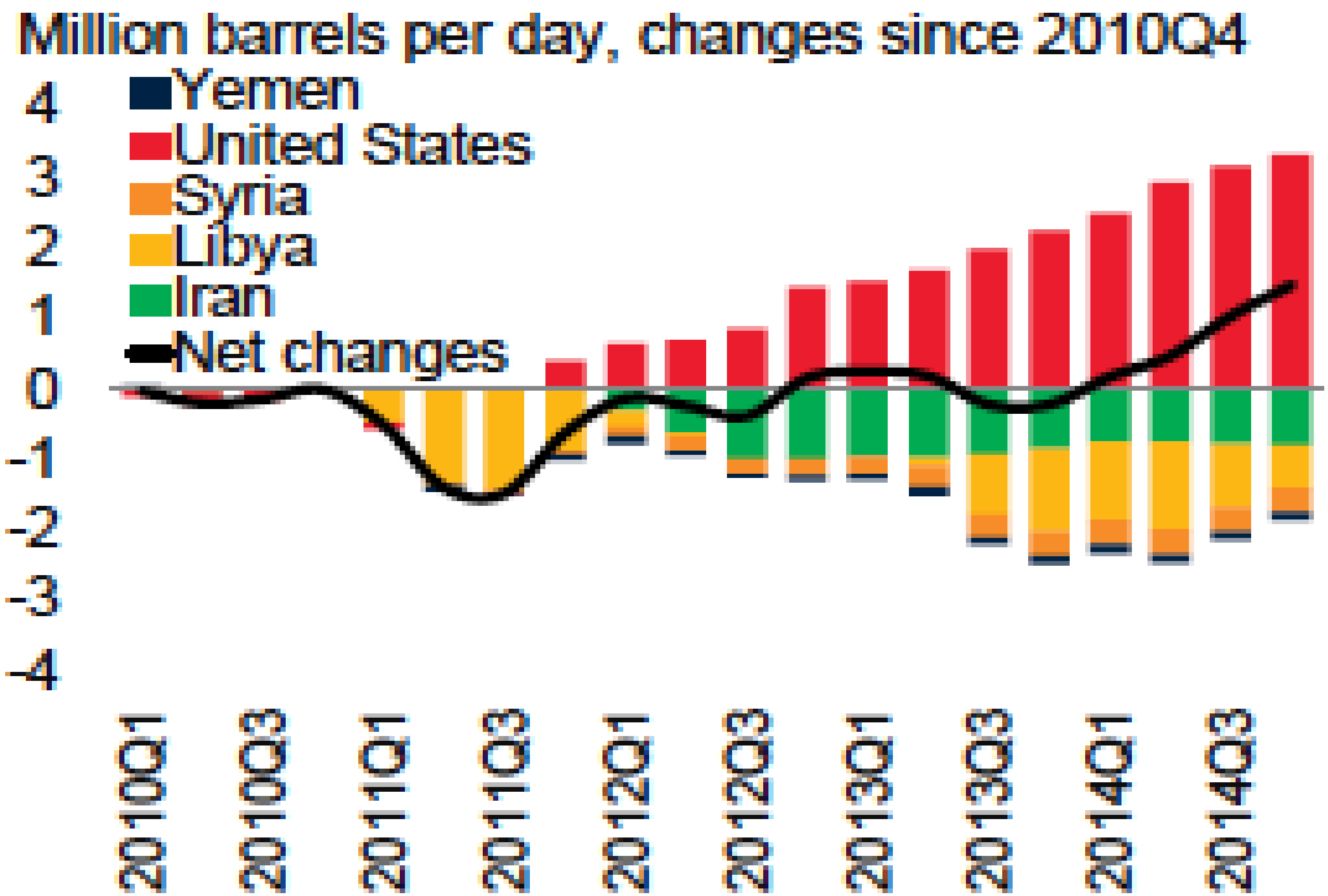
Source: JODI

The **US** pushed the global supply by average **1.21 mb/d** over the last 11 months



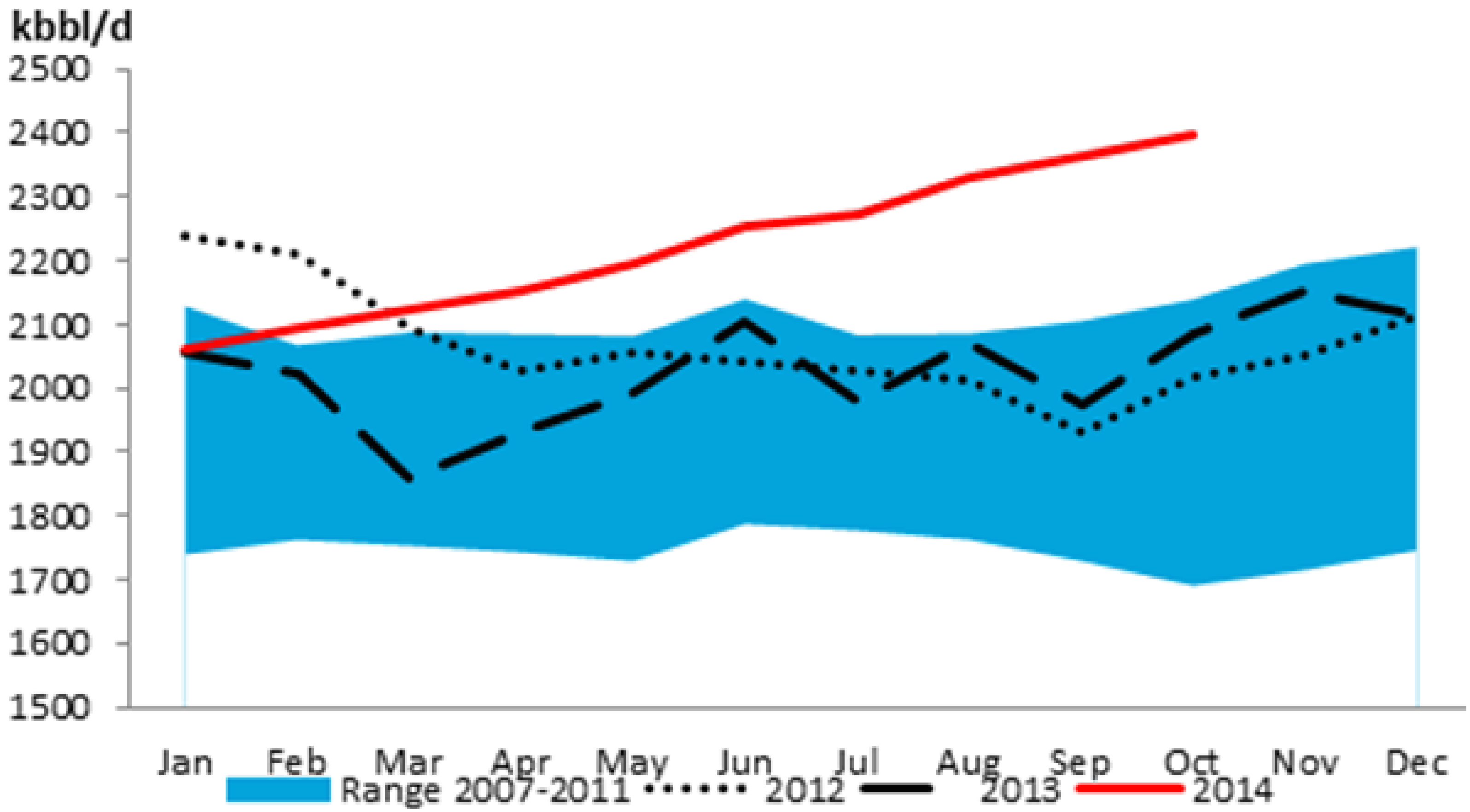
Source: JODI

US output growth has more than compensated output losses elsewhere



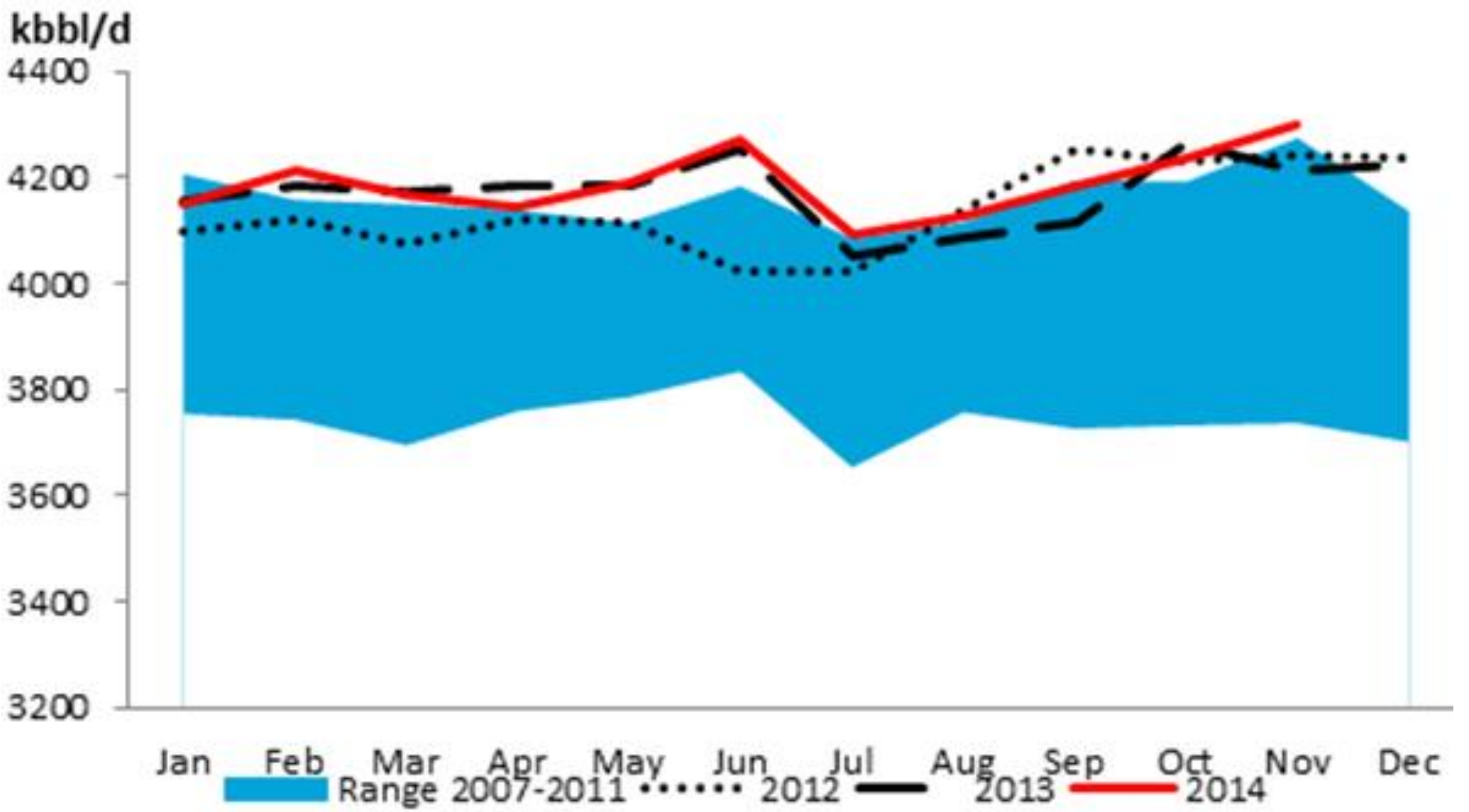
Source: World Bank

Brazil added an average **217 kb/d** of crude supply over last 10 months



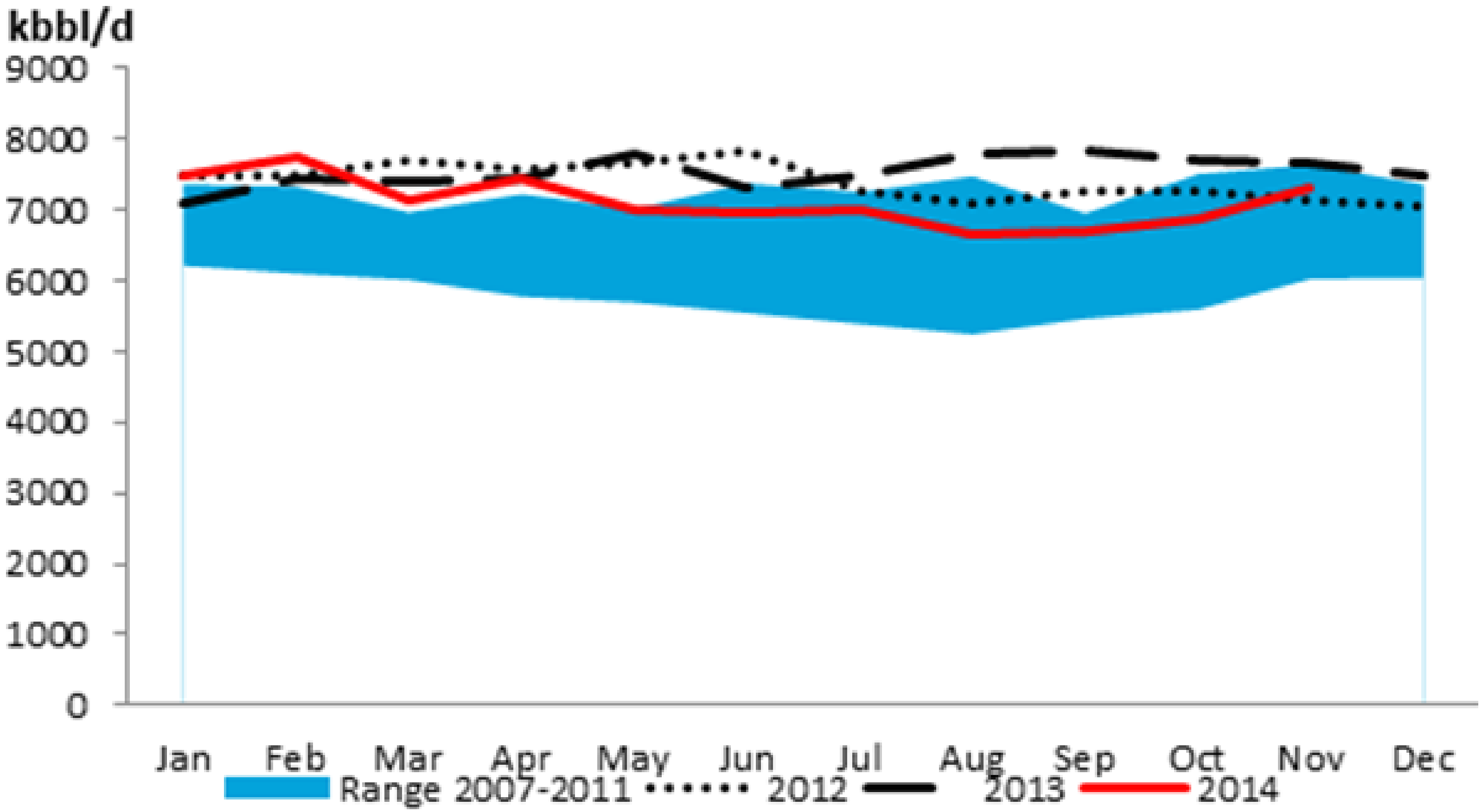
Source: JODI

China marked its highest ever crude oil production in November 2014 at **4.30 mb/d**, working at full capacity



Source: JODI

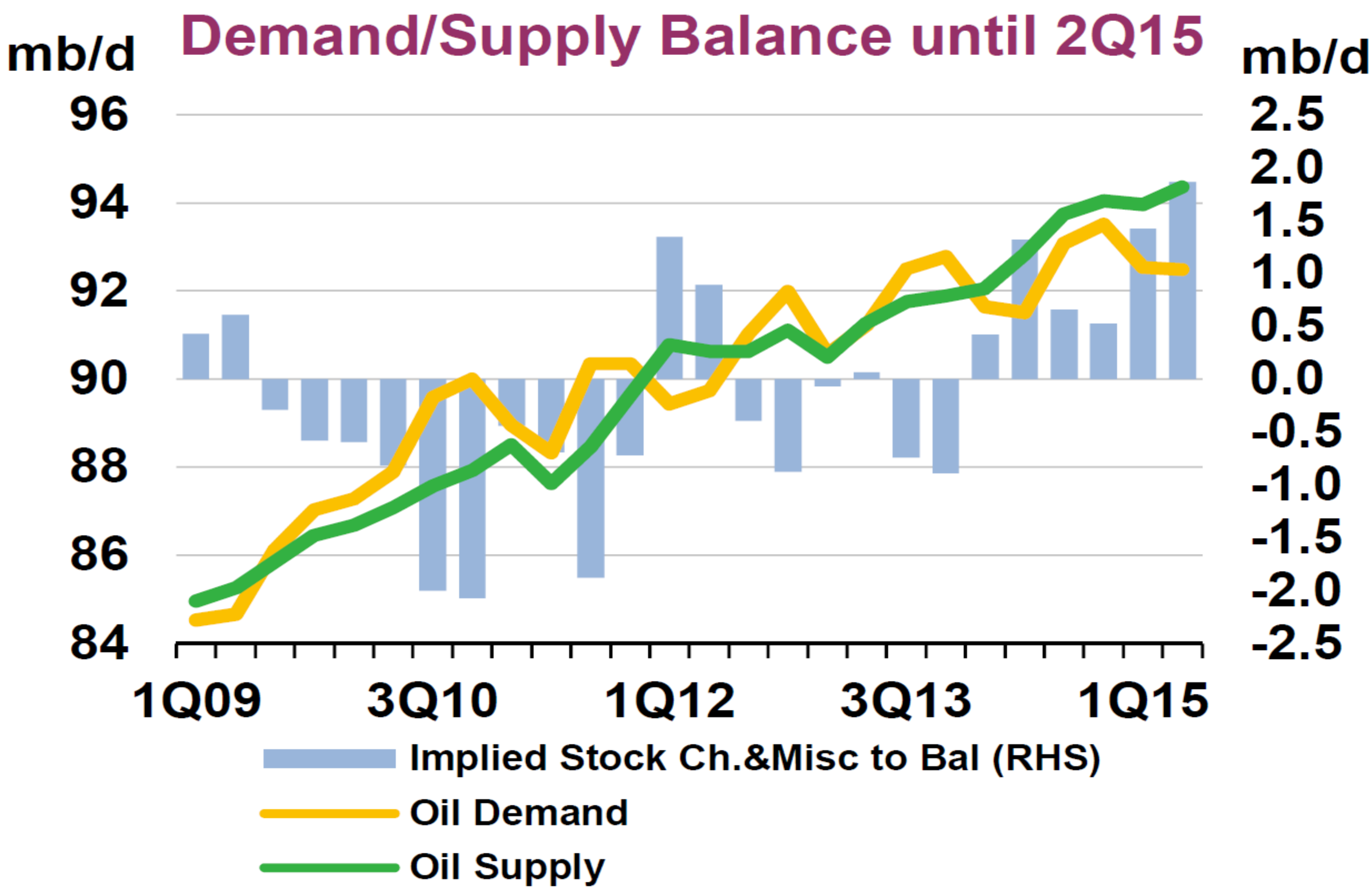
Saudi Arabia's crude exports rose to 7.30 mb/d in November 2014



Source: JODI

Contents

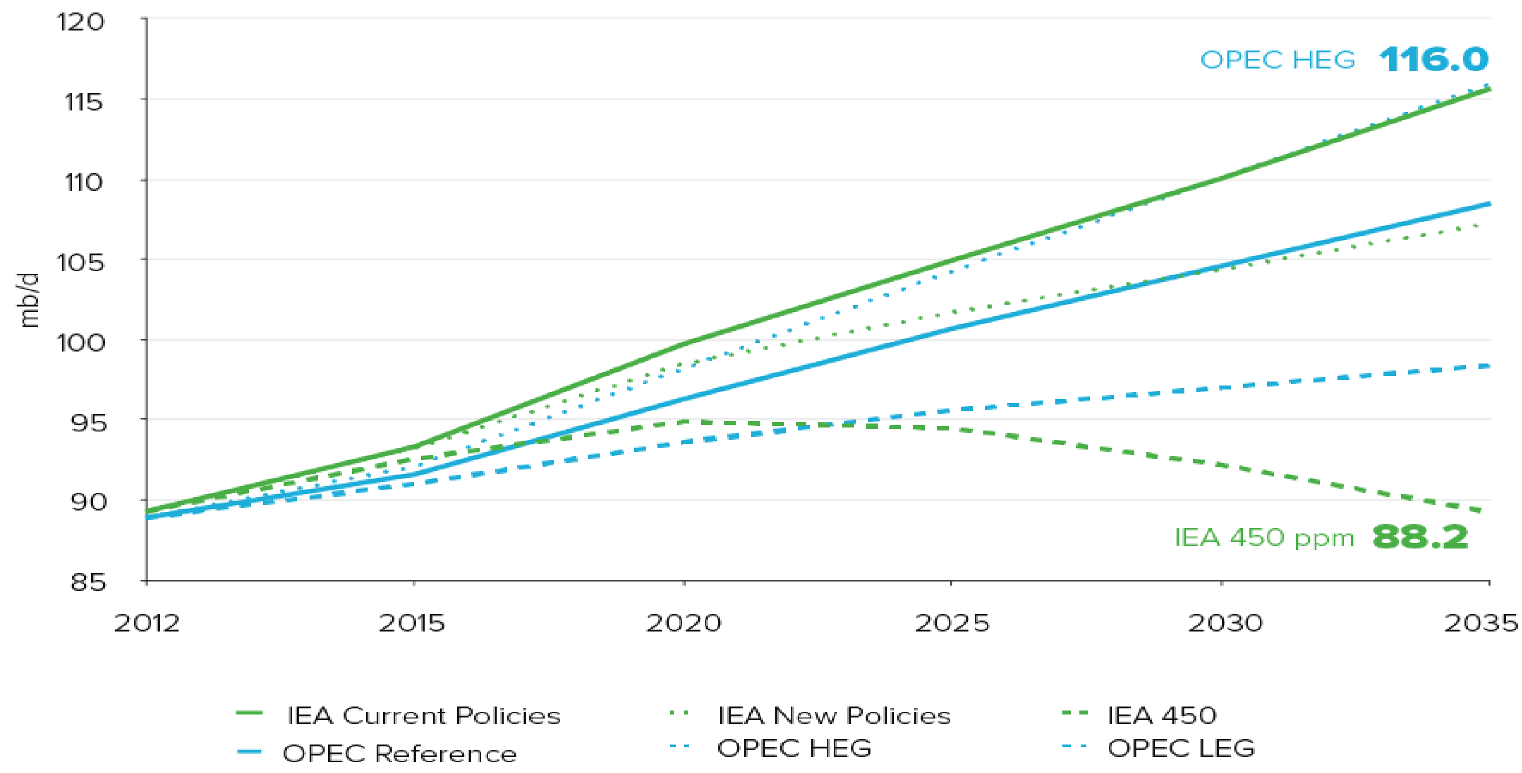
Short-term oversupply?



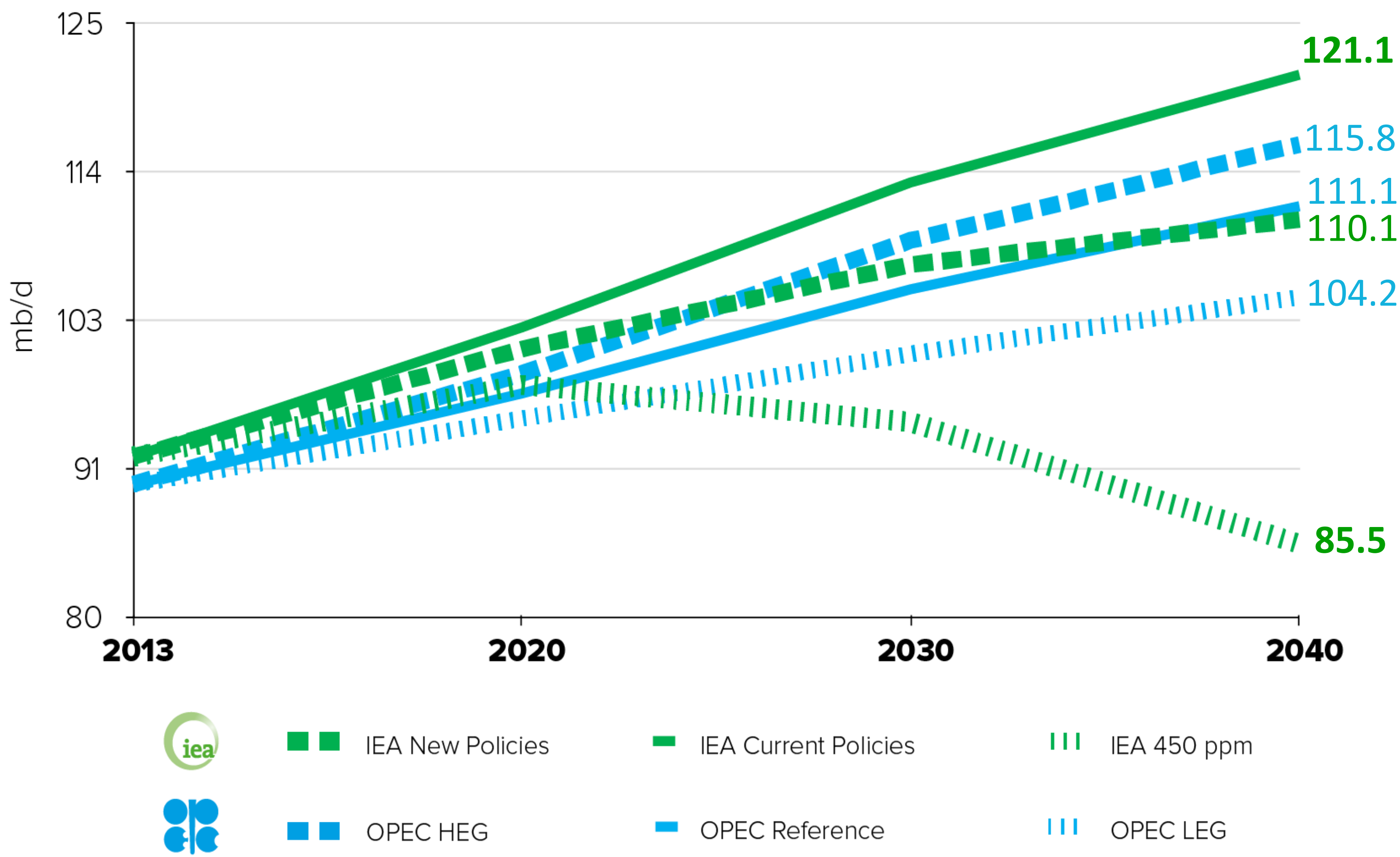
Source: IEA (OMR)

Long term: **differences** for world liquids demand projections in various scenarios, 2012-2035: **27.8 mb/d range**

Figure 17. World Liquids Demand Projections in Various Scenarios



Long term: **differences** for world liquids demand projections in various scenarios, 2013-2040: **35.6 mb/d range**



Source: IEF and Duke University

Final remarks

- Will **investment** be constrained by costs and prices?
- Will more renewables and nuclear enter the **energy mix**?
- Will **Asian demand** compensate for **OECD demand**?
- **Beyond the US** output rise, what can we expect for **oil supply**?