IHS ENERGY

JULY 2014

METHODOLOGIES FOR EVALUATING ABOVE GROUND RISKS

How to be brave in a timid and consensus-driven world

Jamie Webster, Senior Director
+1 202 872 1199
Jamie.Webster@ihs.com

Critical Elements of a Successful Above Ground Risk Group

All members should be eternally curious and eternally questioning

Open, honest communication (aggressive aggression, not passive aggression)

Speaking loudly does not make you right

The most educated and knowledgeable member about a particular subject may not be the best person to receive your forecast from

Overlapping mix of skill sets and people types

Read constantly, think deeply, meet often

Fight Against Cognitive Biases

Four major types:

Social biases

Memory biases

Decision making biases

Probability/belief biases

Petroleum Risk Manager Risk Factors

Politics
- State Capacity
- Political Legitimacy
- Political Violence
- Geopolitical Risk

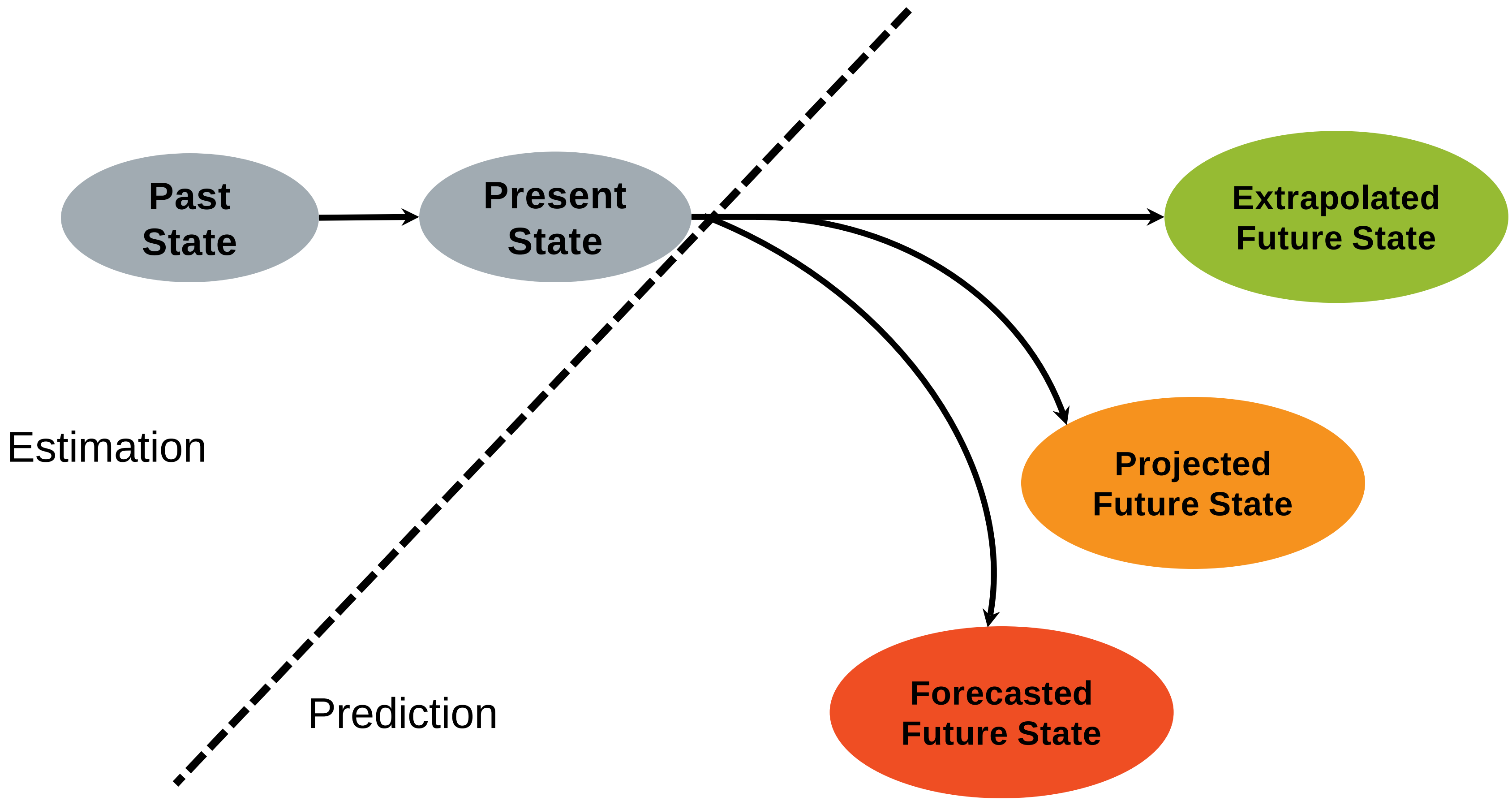
Economics
- Transfer Risk
- Primary Fiscal Balance
- Per Capita GDP Growth
- Level of Development

Hydrocarbon Sector Entry
- International Openness
- Government Take
- Expeditiousness of Contract
- State/NOC role

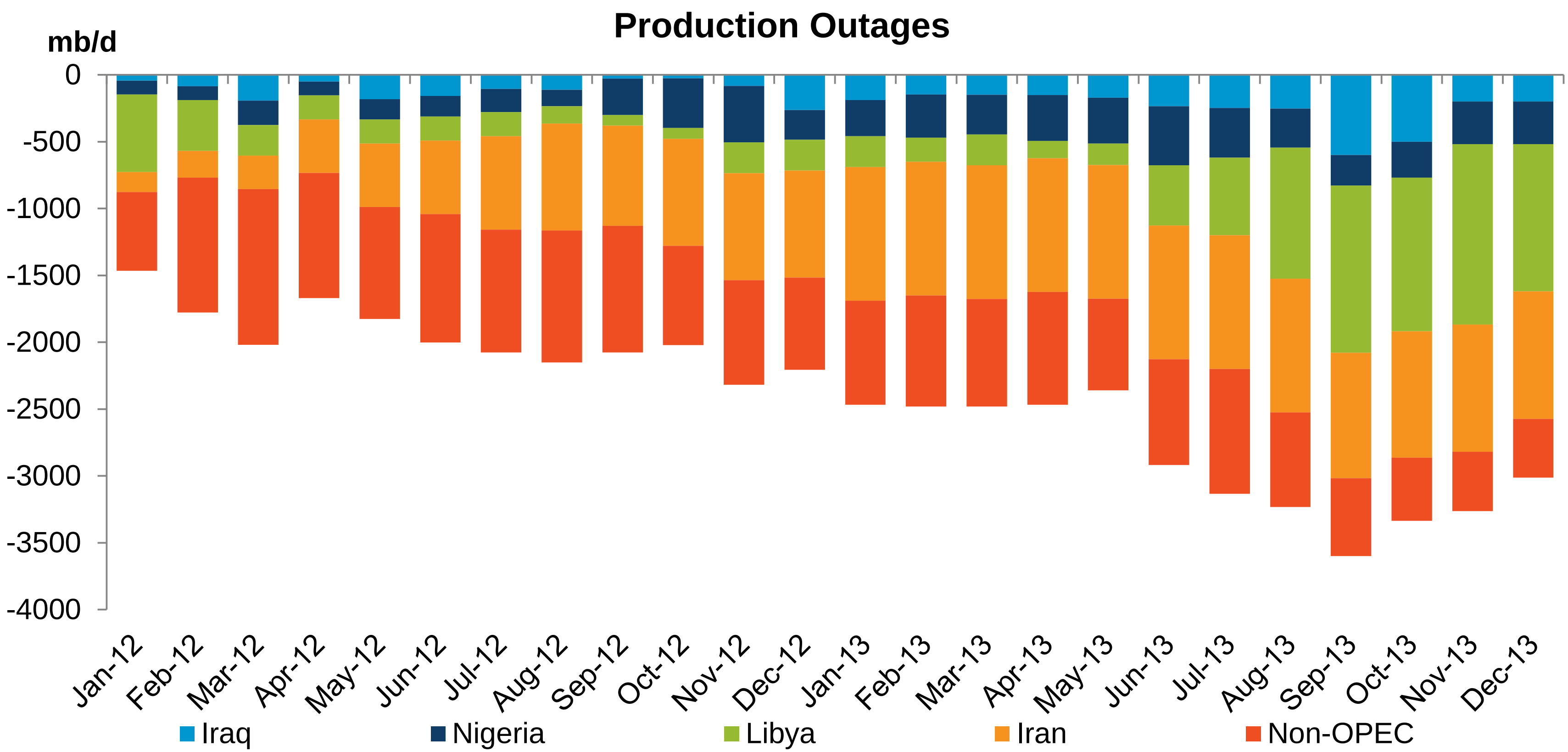
Hydrocarbon Sector Operations
- Sanctity of Contract
- Regulatory Burden
- Civil Society Risk
- Corruption
- Rule of Law

Hydrocarbon Sector Shocks
- Export Risk
- Facility/Personnel Violence
- Ministerial/Policy Volatility
- Labor Unrest

Kalman Filter Methodology (modified)

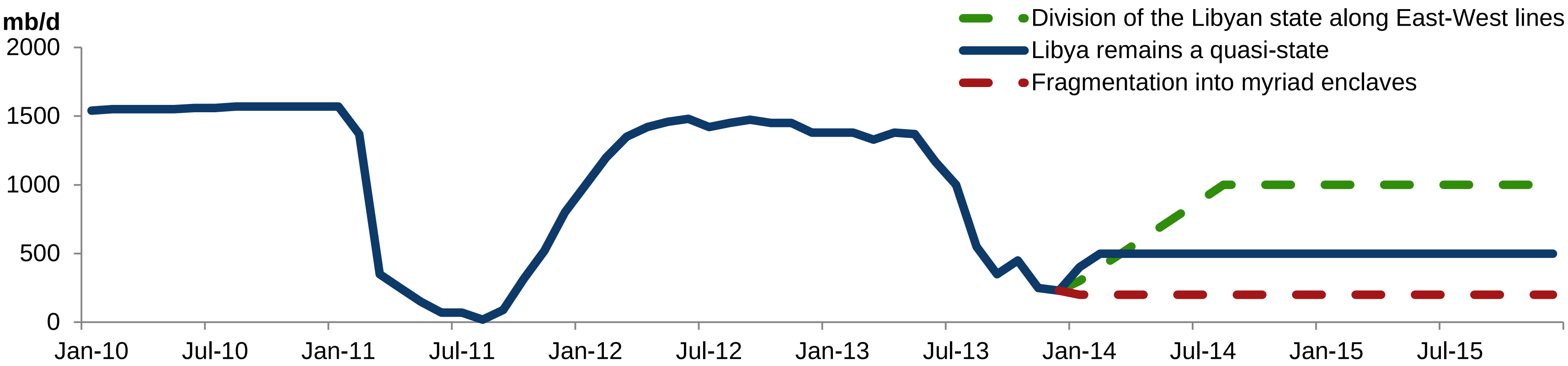


Case Study January 2014: Outages and the Return of Production



To quantify the risks, we have provided three potential cases for each country's output, then examined the results. Our analysis shows that it is unlikely that much or any net production will return in the next 12-18 mos.

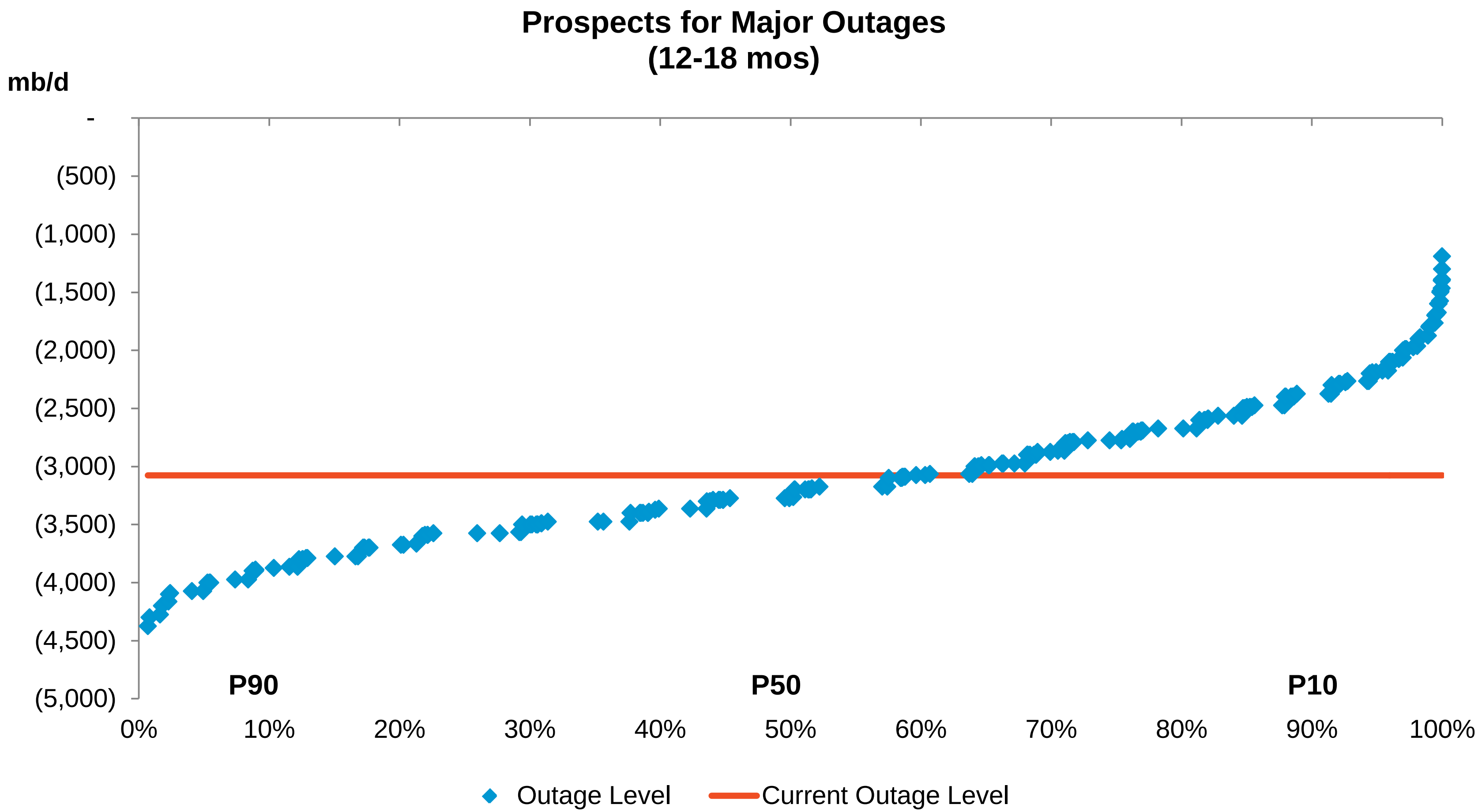
Case Study January 2014: Will Libya Return?



Case	Factors Affecting Output	Effect on Production
Division of the Libyan state along East-West lines (15%)	Overall output approaches pre-war levels, with political authorities in Tripoli and Benghazi each managing their hydrocarbon sector separately. Western Libya incorporates the southern province, keeping intact the existing network of oilfields, pipelines and terminals. Violence flares up occasionally along the East-West border.	~1 mmb/d, with border issues/tribal disputes keeping some output offline
Base Case: Libya remains a quasi-state (60%)	Production remains below pre-war levels and vulnerable to intermittent disruptions as militias vie for control of resources and revenues. The structure of LNOC remains in flux as power dynamics evolve. The state is unable to attract significant new foreign investment given the political uncertainty and security risks.	~500 mb/d but highly volatile and frequently at lower levels
Fragmentation into myriad enclaves (25%)	Production collapses and oil and gas infrastructure is targeted as various factions fight over territory and resources. This scenario would likely either be the result of an attempted secession – triggering internal conflict – or simply the intensification of current tribal and regional rivalries.	~200 mb/d, with remaining production offline for years

Case Study: January 2014

What volumes will come back in 12-18 months?



Contact us

Americas:
+1.800.IHS.CARE (+1.800.447.2273);
customercare@ihs.com

Europe, Middle East, and Africa:
+44.(0).1344.328.300;
customer.support@ihs.com

Asia and the Pacific Rim:
+604.291.3600;
supportapac@ihs.com