TRADE & INDUSTRIAL POLICY STRATEGIES

20 YEARS of supporting policy development through research and dialogue

# Comments on draft IEP 2016

Dr Rod Crompton
Research Fellow
TIPS
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# PERSONAL OPINIONS

Commend the DoE for:

- Evidence based policy formulation
- Public consultation
- Making a big effort

- This contribution intended to strengthen the evidence on which policy will be formulated

# Proportion

Disproportionate preoccupation with electricity

## Compare Electricity and Liquid Fuels

| | Electricity | Petroleum products |
|---|---|---|
| Share of petroleum sales | 60% | 100% |
| Sales | R220 bn | R365 bn |

Any household can solve their heating and cooking needs without grid electricity. But you cant make petrol and plastics in your bathtub.

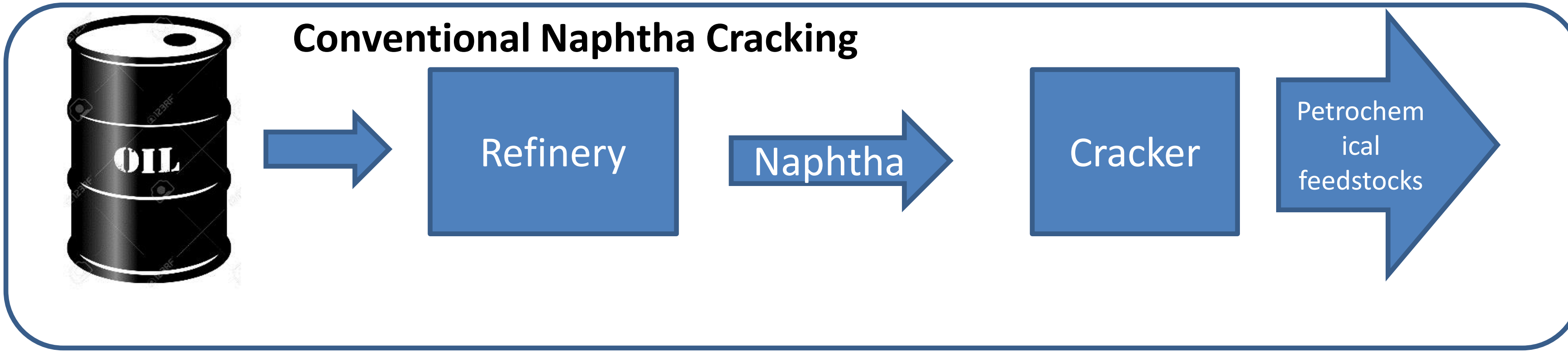
**National Development Plan**:

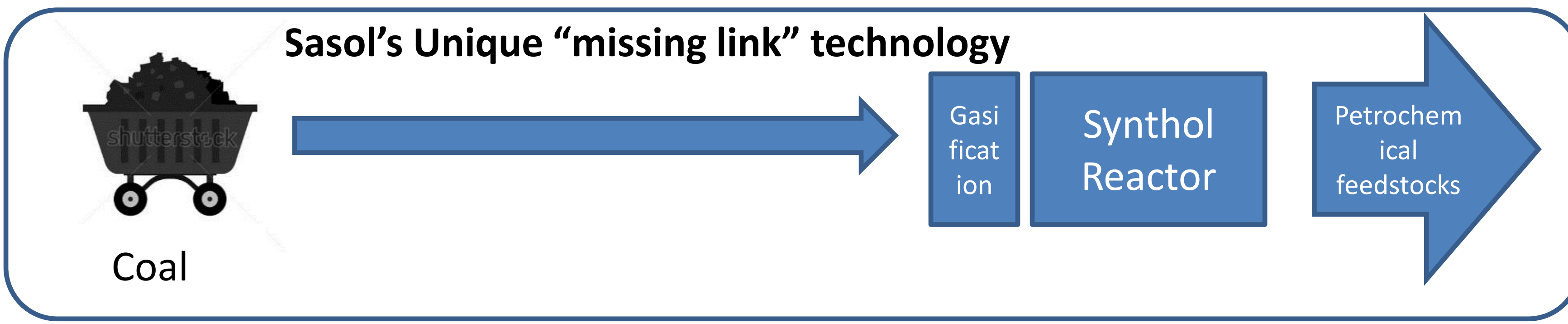
- South Africa's approach to energy planning needs to become more holistic and integrated.
- The Commission will work with the Department of Energy on an interdepartmental process to develop and regularly update integrated energy plans. (NDP) Did that happen?

Petrochemicals and refining inextricably inter-linked

But petrochemicals not considered, not integrated

# Refining and Petrochemicals



**RSA: Short ethylene, long propylene**

| | Naphtha Cracker Ratio | Sasol Se |
|---|---|---|
| Ethylene | | |
| Propylen | | 1.5 |
| | .13 | 0 |
| | .5 | 0 |
| Toluene | .4 | Some solvents |
| Xylene | .5 | 0 |
| Alpha Olefins | 0 | big |

**RSA does not have the full suite. Chemical import bill is huge. Can we have a modern manufacturing economy on this basis?**
**But strong exports in other chemicals**

# Petrochemical problems with IEP refinery options

Table 3-15: Output from liquid fuels production technologies

| Product | New coal to liquids | New conventional crude oil refineries | New gas to liquids | Existing coal to liquids | Existing conventional crude oil refineries | Existing gas to liquids |
|---|---|---|---|---|---|---|
| Aviation fuel | 4% | 10% | 0% | 4% | 7% | 0% |
| Diesel | 39% | 55% | 77% | 39% | 40% | 19% |
| Electricity | 0% | 0% | 5% | 0% | 0% | 0% |
| LPG | 0% | 2% | 5% | 0% | 2% | 8% |
| Paraffin | 7% | 0% | 0% | 7% | 3% | 15% |
| Petrol | 44% | 33% | 0% | 44% | 32% | 54% |
| Residual fuel oil | 5% | 0% | 0% | 5% | 17% | 0% |
| Secondary products | 2% | 0% | 0% | 2% | 0% | 0% |
| Naphtha | 0% | 0% | 13% | 0% | 0% | 0% |
| Petroleum coke | 0% | 0% | 0% | 0% | 0% | 0% |
| Alcohols | 0% | 0% | 0% | 0% | 0% | 4% |
| **Grand Total** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

# Petrochemical problems with IEP refinery options

| **GTL Products (%)** | | |
|---|---|---|
| | **IEP New GTL** | **Oryx[1]** |
| Diesel | 77 | 71 |
| Naphtha | 13 | 26 |
| LPG | 5 | 3 |
| Electricity | 5 | 0 |
| Total | 100 | 100 |

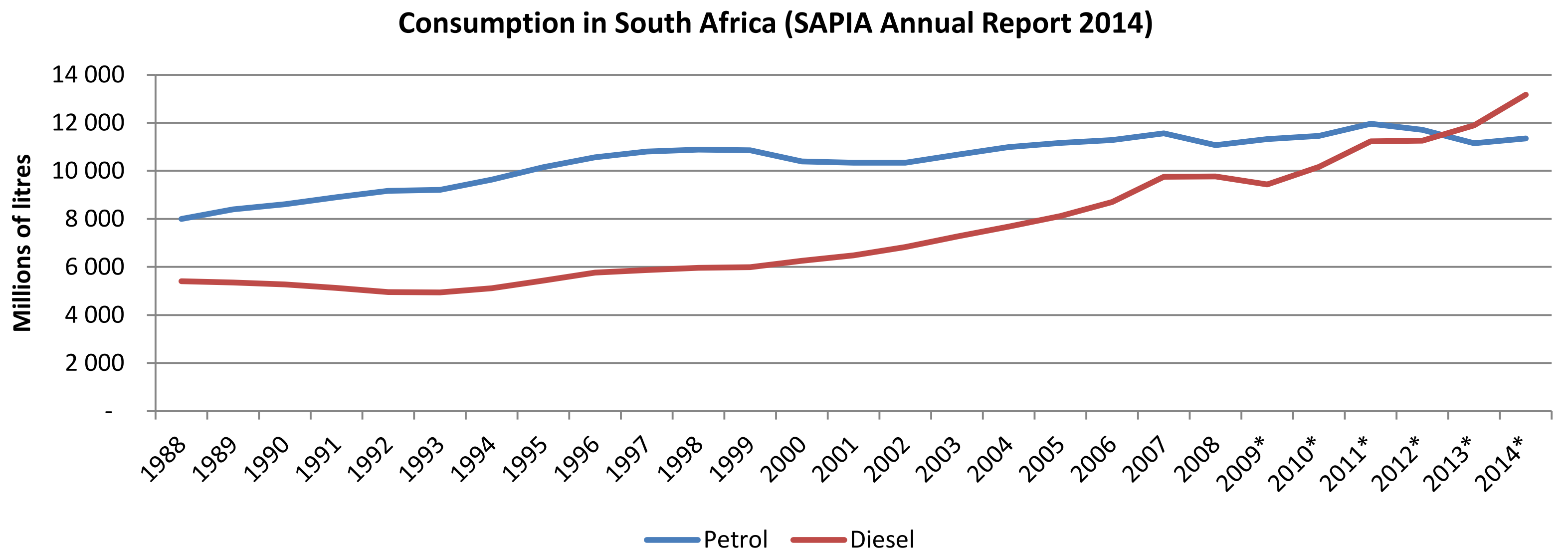
Notes: 1 Qatar Petroleum (51%) and Sasol (49%).

# Refinery Assumptions

- Security of supply option: New crude refinery 200 000 bbl/d – not competitive size for a new refinery.
- Elsewhere different figures used – none world scale
- Security of supply scenarios:
  - 250 000 bbl/day.
  - 300 000 bbl/day and
  - 360 000 bbl/day.
- "All four scenarios assume the presence of economically recoverable shale gas and that shale gas is moderately priced" (pg. 117) (R40/GJ)
- Why? Evidence to support that assumption?
- Lack of water, long way to markets, no supporting industry or infrastructure.

# Demand Assumptions

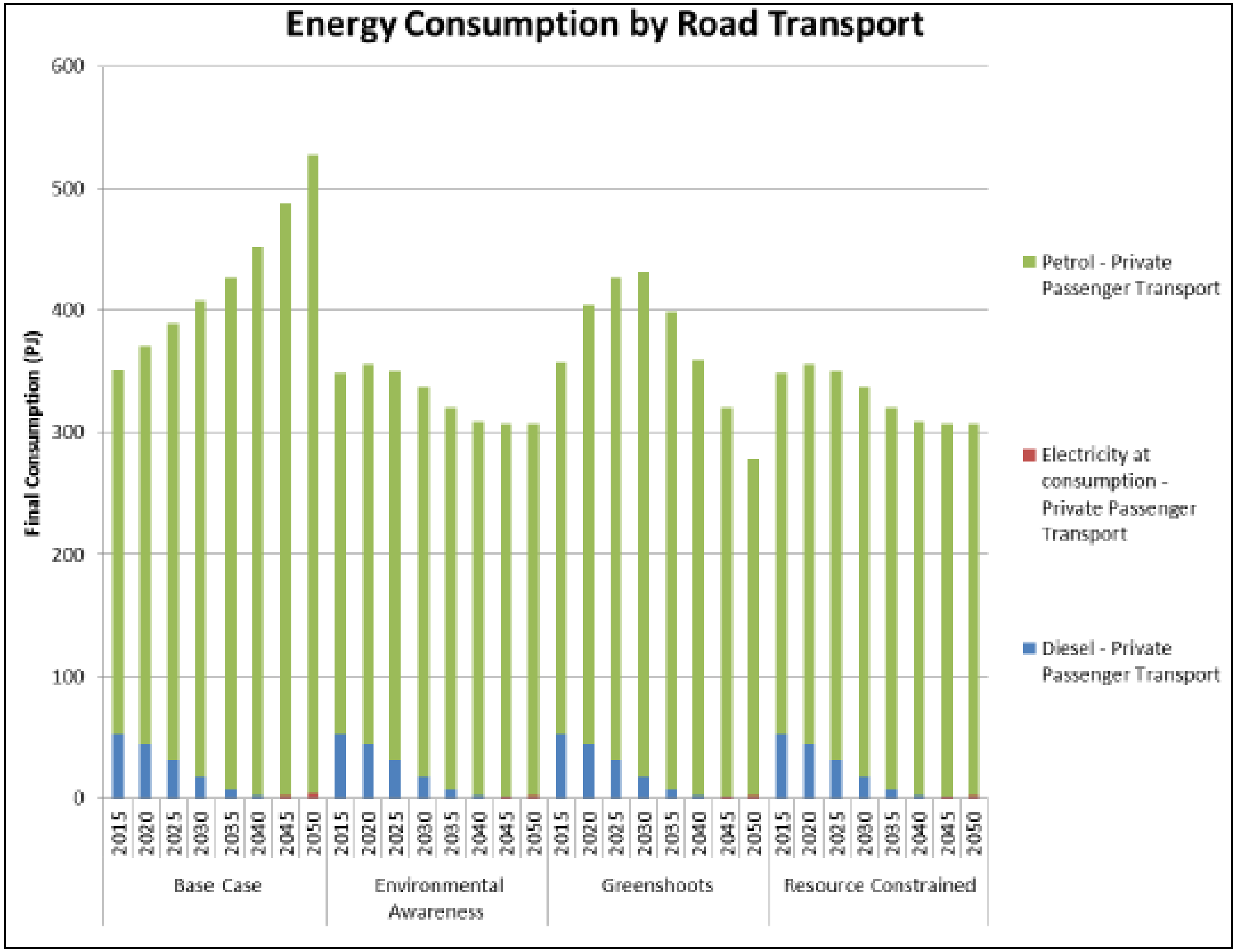
IEP: “While the current proportion of petrol consumption against that of diesel consumption is slightly higher across the entire transport sector, this <u>will equalise over the next ten years</u>, with future consumption in diesel surpassing that of petrol in the longer term”. (pg 32)




| IEP Assumptions (transport) | | |
|---|---|---|
| | Petrol | Diesel |
| | 52% | 36% |
| | 1,4 | 1 |

| DoE | Petrol | Diesel |
|---|---|---|
| 2012 | 1,04 | 1 |
| 2013 | 0,94 | 1 |
| 2014 | 0,86 | 1 |

**IEP assumptions (*Energy Digest, 2010* ) out of date. Do not accord with DoE data.**




*Source: DoE Analysis*

**Figure 0-26: Energy consumption by private passenger vehicles and fuel type**

- Evidence to support this? Some very aggressive assumptions?
- Assumptions on Uber, Car to Go, Ride Share etc. ?

# Demand assumptions

- Liquid fuel imports: All scenarios have different 2015 starting points. How is that possible?
- Petroleum product prices : regulatory assumptions not clear
- Electric vehicle penetration: a maximum 20% penetration rate by 2050
- Later Table (pg 71) says 20% p.a. for all scenarios - confusing)
- Where is the evidence to support this?

# Gas

“Despite extensive drilling along South Africa’s coastline, only marginal conventional gas discoveries have been made, with limited future prospects.”

- Does Petroleum Agency SA agree with this?
- E&P Regulatory dispensation has been stalled for about 15 years
- Shale gas assumption: R40 per GJ – very low.

# Ethylene from LNG?

| Gas costs | $/MT |
|---|---|
| USA Henry Hub natural gas price | 170 |
| Shipping costs as LNG | 481 |
| Regasification cost in RSA | ?? |
| Gas costs as ethylene feedstock | 651 |
| Gas to ethylene manufacturing cost | ??? |
| **Ethylene production cost** | **651+** |
| | |
| **Ethylene production costs** | |
| USA Ethane | 250 |
| West Eupoean naptha | 450 |
| SE Asia naptha | 400 |
| NE Asia naptha | 475 |

- Natural gas demand base case 2015 = 80 PJ but actual is about 120+ PJ

- LPG demand base case for 2015 about 1/3 of actual (DOE data)

# Future Refining and Petrochemical capacity
# Suggestions

- Conduct bidding rounds like REIPPP
- Specify the <u>outputs</u> including petrochemical feedstocks
- Not the process technologies (don't repeat the errors of the REIPPP trying to pick technologies)

# Way Forward

- Alignment with Transnet Master plans ✓
- A study to determine the macroeconomic impact of liquid fuel imports – in particular considering the impact on the Balance of Payments – don't forget petrochemicals
- A study to assess and quantify the job creation and localisation - don't forget petrochemicals
- A study to determine the average construction, operating and maintenance costs - don't forget petrochemicals
- The potential impact and incorporation of biofuels framework implementation – leave it till next time when oil prices might be higher

THANK YOU

rodcrompton1@gmail.com