



National Climate Change Response Dialogue : 12 September 2014

Transnet's contribution towards South Africa's efforts to cut down emissions in the transport sector





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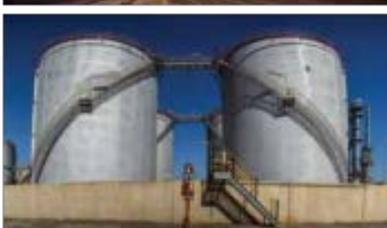
About Transnet

Transnet is South Africa's State-owned freight transport and logistics company and is the custodian of the country's rail, ports and pipeline networks.

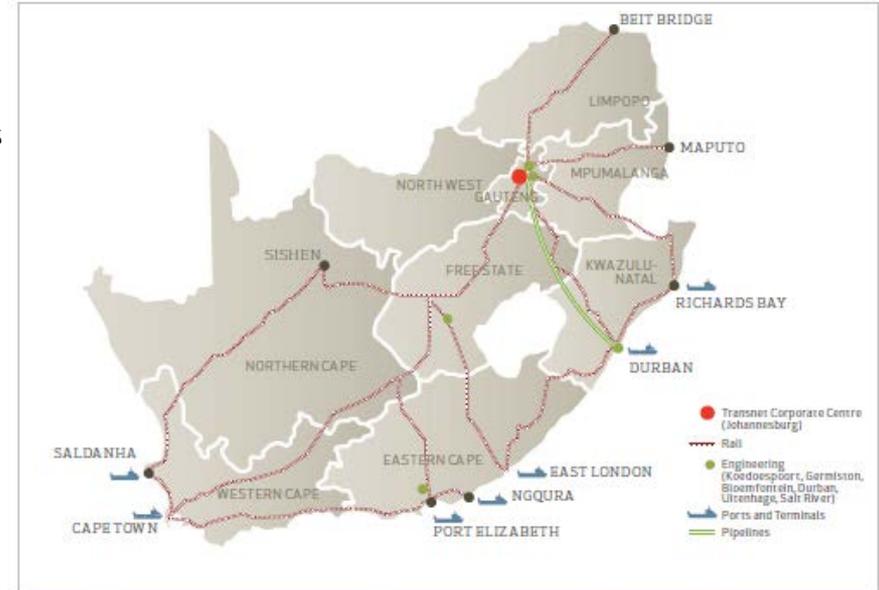
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- Transnet Freight Rail (Freight Rail), the largest of the five Operating divisions, operates a rail network across South Africa which transports bulk, break-bulk and containerised freight.
- The Freight Rail network and rail services provide strategic links between mines, production hubs, distribution centres and ports; and connect with the over-border railways of the region.
- Shifting rail-friendly freight off roads and onto rail reduces logistic costs, impacts positively on the road network, reduces carbon emissions in the transport sector.



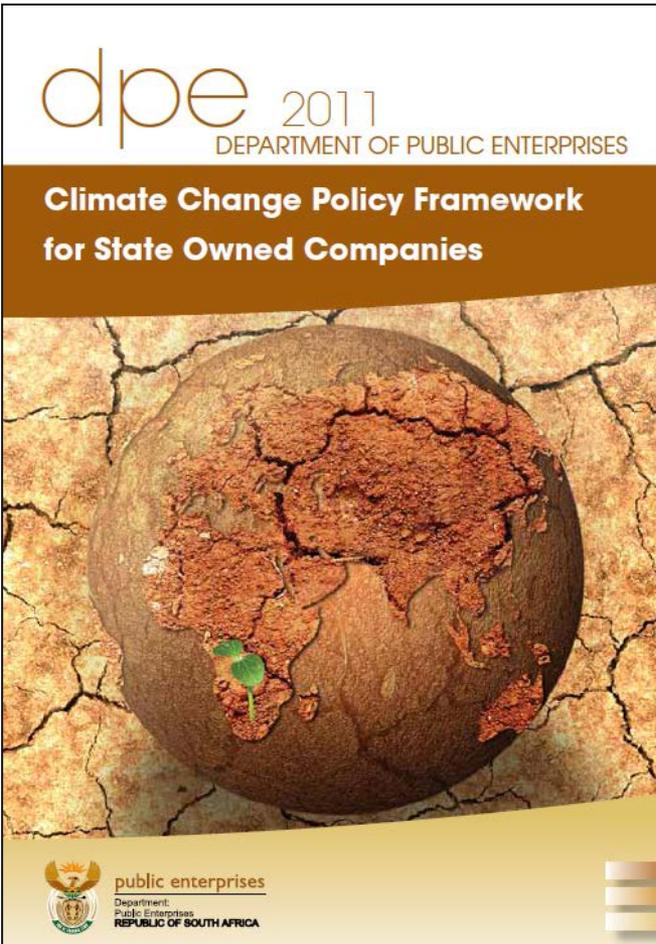
Geographic location of the Transnet Corporate Centre and Operating divisions.

Transnet has a responsibility to unlock economic, social and environmental value through the execution of its mandate whilst building a commercially viable business enterprise.



MARKET DEMAND
STRATEGY

- **>R300bn** capital investment programme
- Expanding **rail, port and pipeline infrastructure**
- **Increase** in capacity to meet market demand
- Continued **financial stability** and strength
- Significant **productivity and operational efficiency** improvements
- **Shift from road to rail** – reducing the cost of doing business and carbon emissions
- Enabling **economic growth**
- **Job creation**, skills development, **localisation**, empowerment and transformation opportunities



“To optimise the impact of SOCs on reducing GHG emissions and develop the Green Economy without compromising financial viability”

- Effective and **sustainable** responses
- **Balancing** commercial, economic, developmental and environmental objectives
- Enable SOC to leverage climate related **incentives**
- Encourage **innovation**
- Begin **integrating** Climate Change into planning, operating and procuring

The Minister committed SOCs to lead the transition to a Green Economy by developing and implementing Climate Change plans.

Road to Rail

Modal shift from road-to-rail, lowering South Africa's carbon emissions

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- It is globally known that rail transport is three to four times more efficient than road transport. In addition, rail offers cleaner, safer, cheaper and more reliable freight mobility through improved road safety, reduced road congestion and pollution, and a lower cost of doing business.
- Government's National Climate Change Response White Paper, 2011 identifies a modal shift from road-to-rail as a flagship carbon mitigation programme for South Africa.
- As the owner and operator of the country's rail freight network, Transnet has undertaken to increase its rail market share to 35% by 2018/19, and to demonstrate the carbon emissions saving achieved annually through its growing market share.

Top 10 road-to-rail volume gains for 2013/14 (April 2013 to March 2014)

| Commodities | Volumes gains (tons) | Emissions avoided (tCO ₂ e) |
|---------------------------|----------------------|--|
| Manganese (Export Durban) | 16 063 | 198 |
| Coal (Eskom) | 1 323 767 | 36 436 |
| Chrome and ferrochrome | 618 218 | 70 090 |
| Iron ore (Domestic) | 566 561 | 134 980 |
| Manganese (Domestic) | 108 354 | 38 068 |
| Mineral mining | 2 006 556 | 250 414 |
| Iron and steel | 107 685 | 26 055 |
| Fertiliser | 10 338 | 2 485 |
| Intermodal (Container) | 1 734 678 | 276 303 |
| Automotive | 15 397 | 642 |
| Total | 6 507 617 | 835 670 |

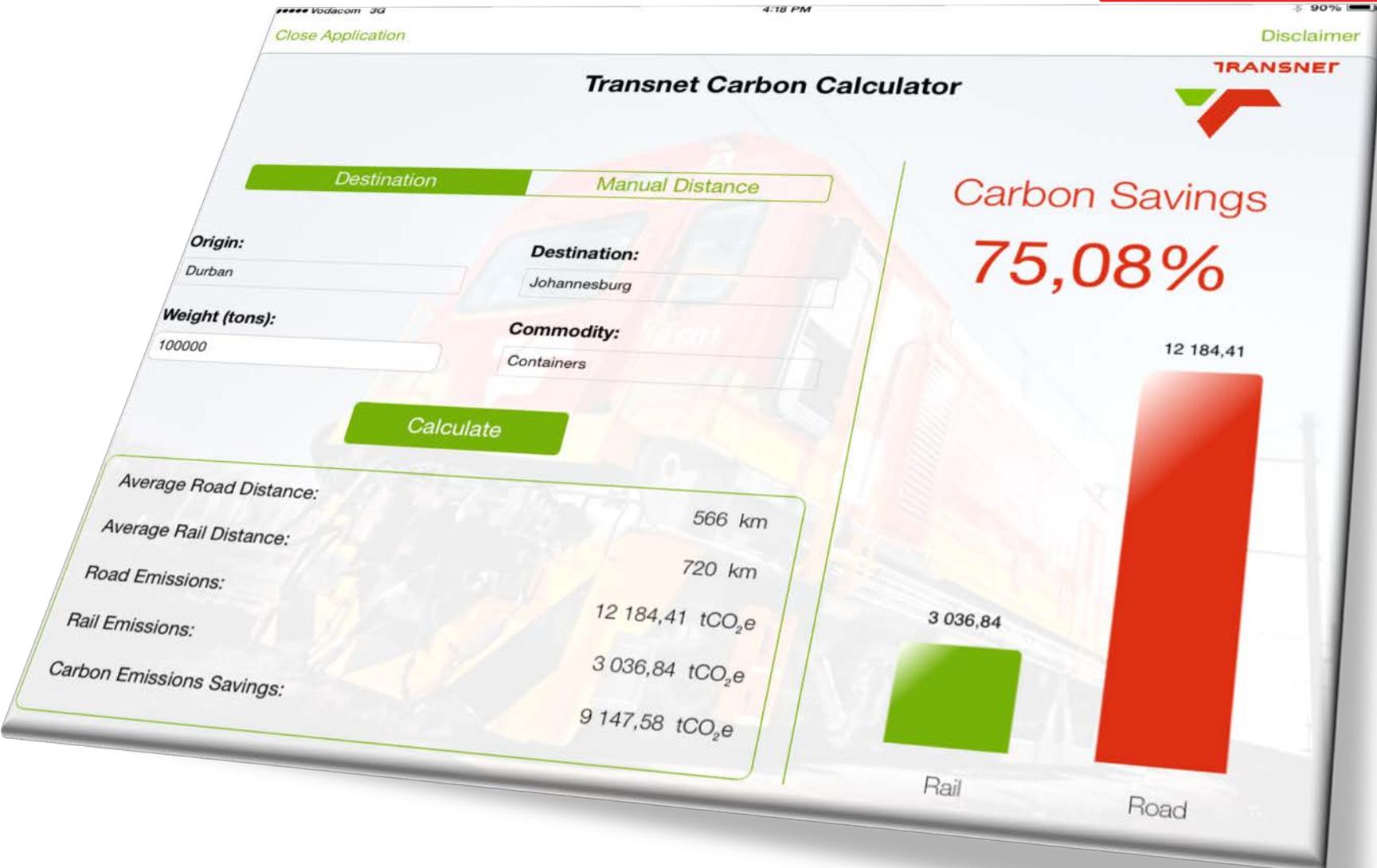
Road to Rail

A Carbon Calculator has been developed by Transnet to assist our customers to calculate the carbon emissions benefit of moving specific tonnages of cargo in South Africa by rail instead of road

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Road to Rail

Locomotive acquisition programme driving a shift from road to rail

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| Year | General freight business | | | | Export coal |
|------|--------------------------|-------------------|-----------------------|----------------|--------------------------|
| | 95 electric locomotives | 1 064 locomotives | 60 diesel locomotives | Wagons for MDS | 100 electric locomotives |
| 2015 | 86 | – | 19 | 2 704 | 17 |
| 2016 | – | 148 | 41 | 3 803 | 83 |
| 2017 | – | 492 | – | 3 203 | – |
| 2018 | – | 424 | – | 4 065 | – |
| 2019 | – | – | – | 5 575 | – |
| 2020 | – | – | – | 2 314 | – |
| 2021 | – | – | – | 1 294 | – |



Road to Rail

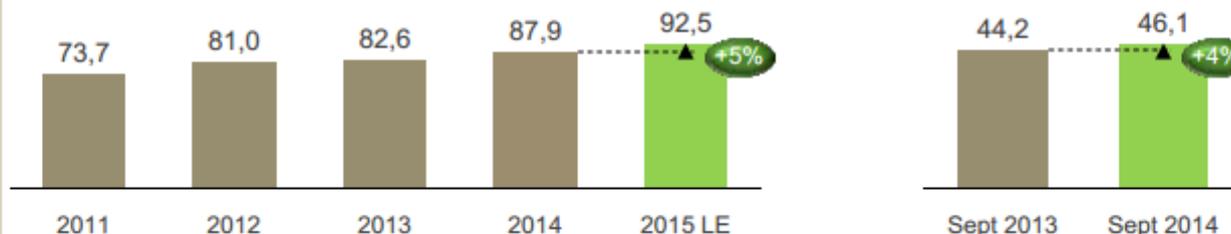
Volumes and operations



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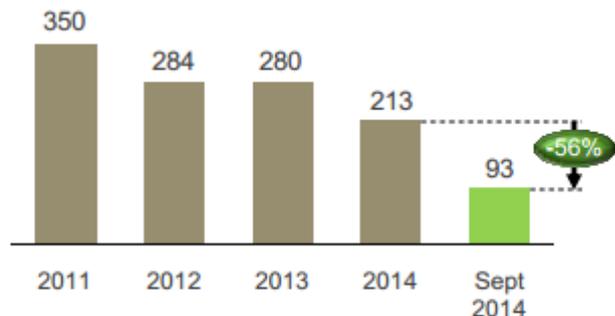
Rail – General freight business (GFB)

Volumes (mt)

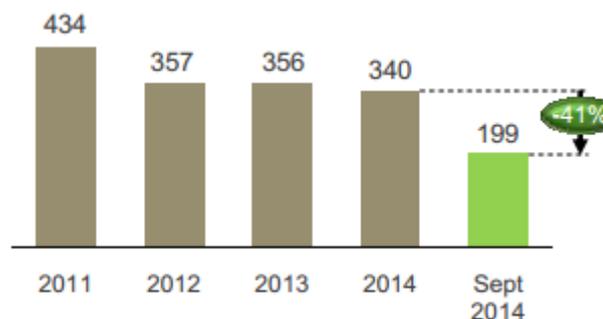


Productivity and efficiency

On-time departure (minutes)



On-time arrivals (minutes)

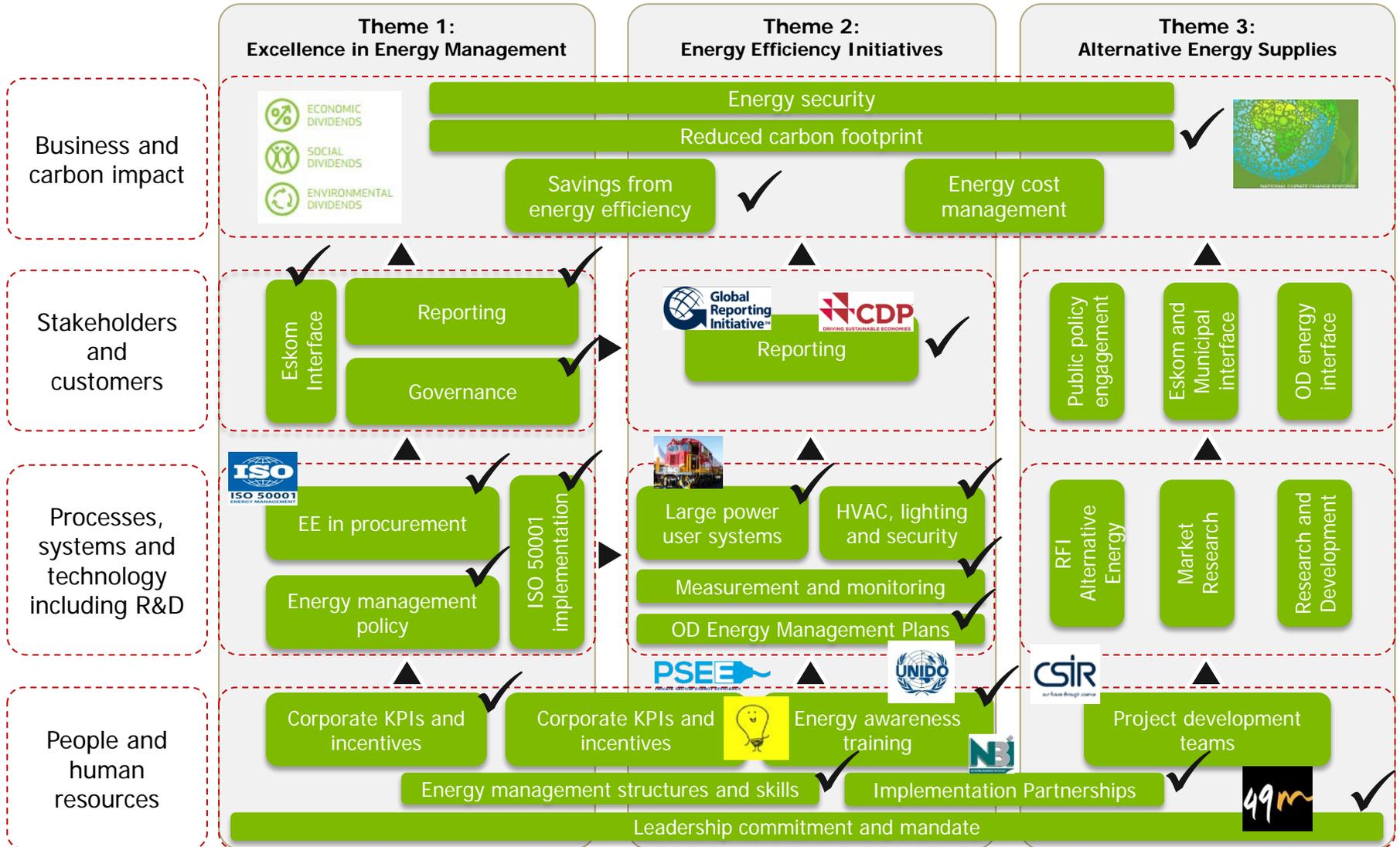


- General freight volumes increased by 4% compared to the prior period, mainly due to:
 - improved operational efficiencies;
 - the optimisation of the value chain with port terminals and customers; and
 - growth of market share arising from the road-to-rail modal shift.
- Mineral, mining and chrome volumes were hampered by an extended period of strike.
- The latest estimate suggests that at year end, GFB volumes will exceed prior year by 5%.
- On-time departures and arrivals are performing well due mainly to process adherence improvements, including a focus on the countdown and re-planning processes.

Initiatives in implementation



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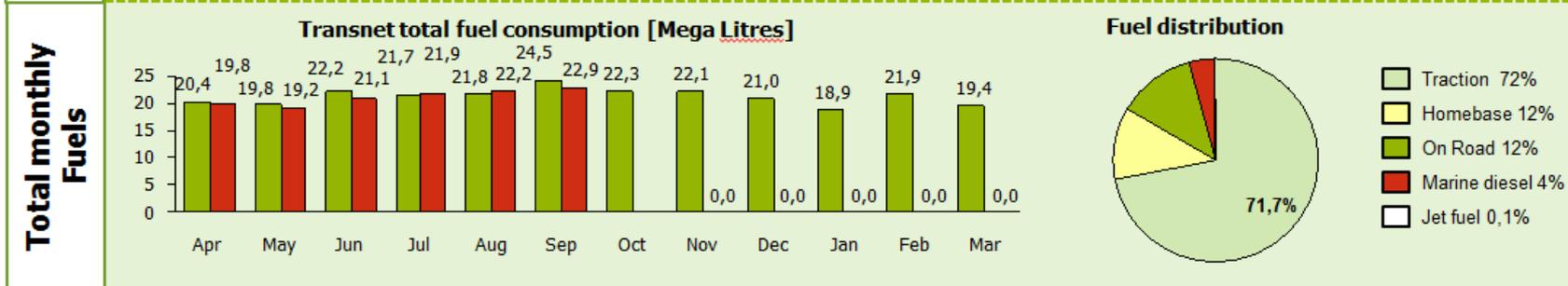
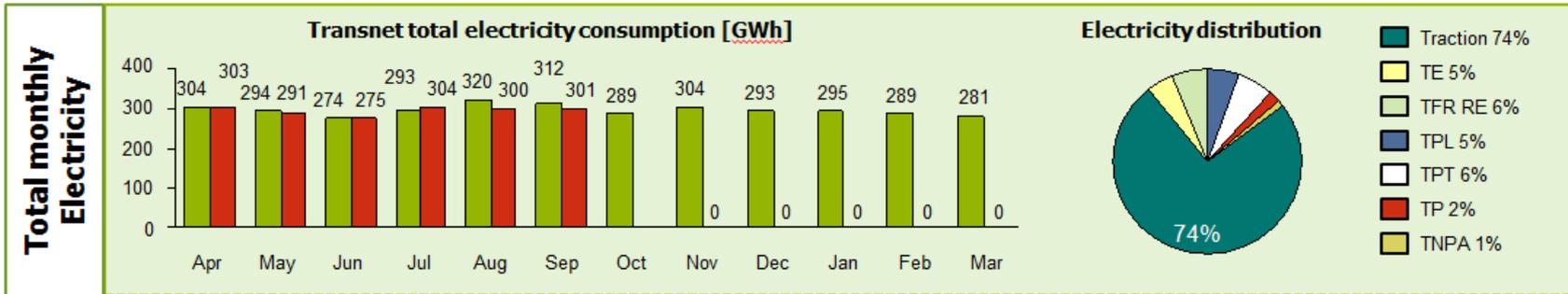
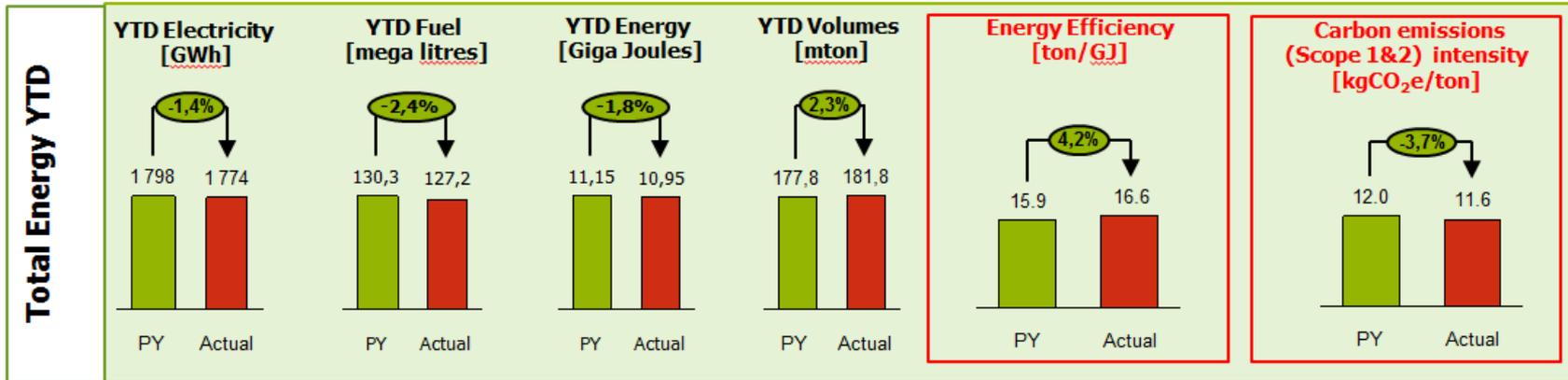
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Key initiatives

Transnet's Energy Performance Management
September 2014

[GWh = kWh x 10⁶] / [GJ = J x 10⁹]

2013/14
2014/15



Key initiatives

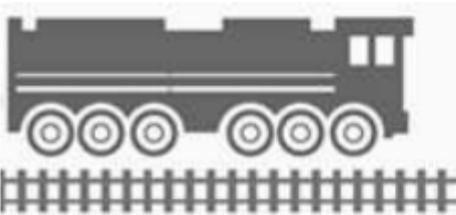
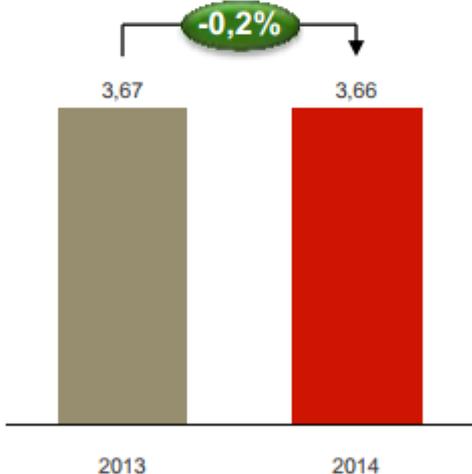
Transnet's Energy Performance Management
September 2014



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Electricity consumption

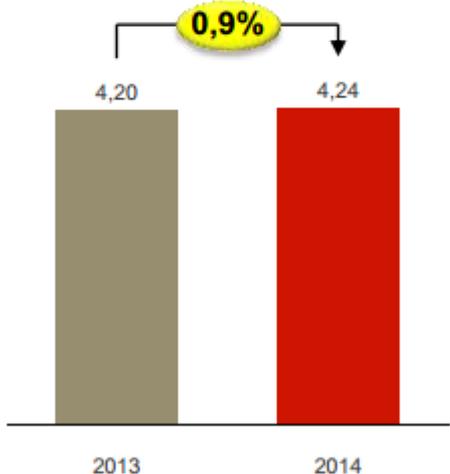
Total electricity consumption
(million MWh)



176 185MWh electricity regenerated by new 19E and 15E locomotives.

Carbon emissions

GHG emissions
(mtCO₂e)



Road-to-rail: Top 10 commodity volume gains on rail reduced the transport sector's carbon emissions by **0.8 mtCO₂e**.

Key initiatives

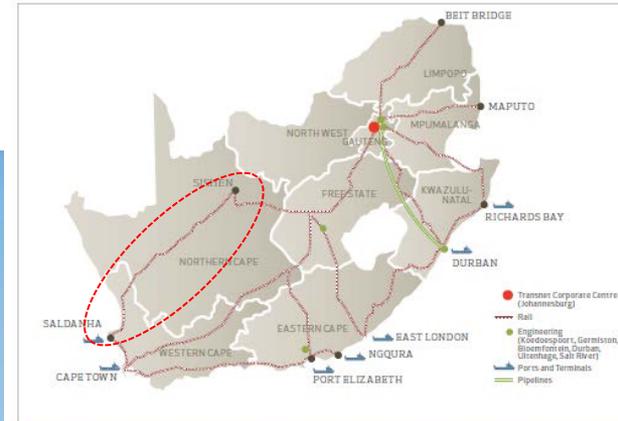
Regenerative energy in locomotives



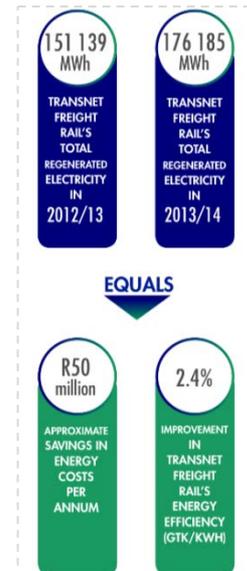
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A total of **176 185** megawatt hours of electricity regeneration was recorded in Freight Rail during 2013/14, from the Class 15E and 19E locomotives; an improvement of **16.6%** on the previous year:

Class 15E locomotives working on the iron ore line regenerated 28.0% of energy consumed on a round trip from Sishen to Saldanha. This resulted in 99 502MWh (24.0%) energy regeneration in 2013/14.



Geographic location of the Transnet Corporate Centre and Operating divisions.



Key initiatives

Regenerative energy in locomotives

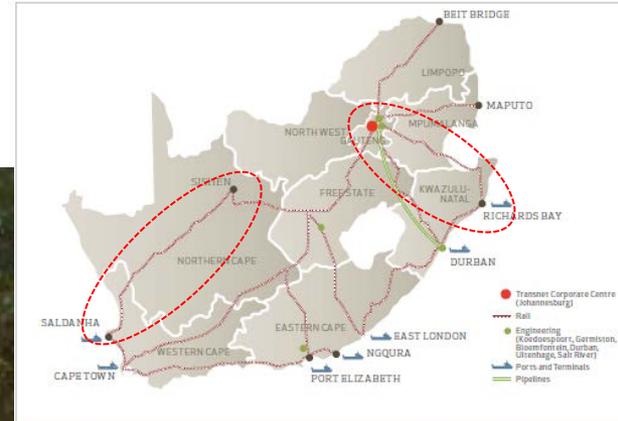


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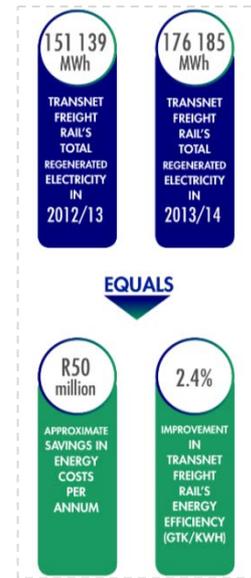
A total of **176 185** megawatt hours of electricity regeneration was recorded in Freight Rail during 2013/14, from the Class 15E and 19E locomotives; an improvement of **16.6%** on the previous year:



Class 19E locomotives working on the coal line regenerated 27.0% of energy consumed on a round trip between Ermelo and Richards Bay. This resulted in 76 682MWh (14.0%) energy regeneration in 2013/14.



Geographic location of the Transnet Corporate Centre and Operating divisions.



Key initiatives

Research and Development

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The following sustainable energy options for Transnet equipment use are currently being explored by the R&D unit in Engineering which focuses on the operationalisation of new, relevant technologies:

- Second generation biofuels for diesel locomotives and port equipment;
- Natural gas as a fuel source for locomotives and other equipment;
- Fuel cells on locomotives as alternative energy sources;
- Wagon covers to reduce energy loss through drag effects; and
- Harnessing wasted energy by capturing and re-using heat from exhaust systems.

