



**A Benchmarking Paper on the Role of
Infrastructure in Economic Development and
Promoting an Inclusive Low-carbon Future in
South Africa**

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Infrastructure and Economic Development

- Infrastructure development supports economic development.
- Infrastructure underlies and supports the operations of the economy and networks people, products, services, and innovations in an increasingly connected world.
- Infrastructure narrows the time and spatial barriers within and among countries and thus helps to spur economic activity and dynamic enterprise activity.
- Infrastructure, as an enabler of social and economic activity, possesses important feedback mechanisms for transforming the interlinkages between business, people, and connectivity.
 - Inputs, human capital, modes of transport, communication, etc.
 - Costs, prices, social reproduction, mobility of people, things, and ideas.

Infrastructure and Inclusive Development

- Infrastructure development supports social cohesion, and inclusion, by supporting access to dignified living standards and access to economic opportunities.
- Public infrastructure development helps level the playing field between different groups in society and thus supports access to information, human capital development, innovation, the entrepreneurial decision, start-up activity, market entry, and competition.
- Green infrastructure supports social and mental wellbeing in the built environment and thus includes people in their right to safe and clean surroundings. It also creates new opportunities.
- But, a dynamic transition to low-carbon economy must ensure social justice and a common future that is socially cohesive.

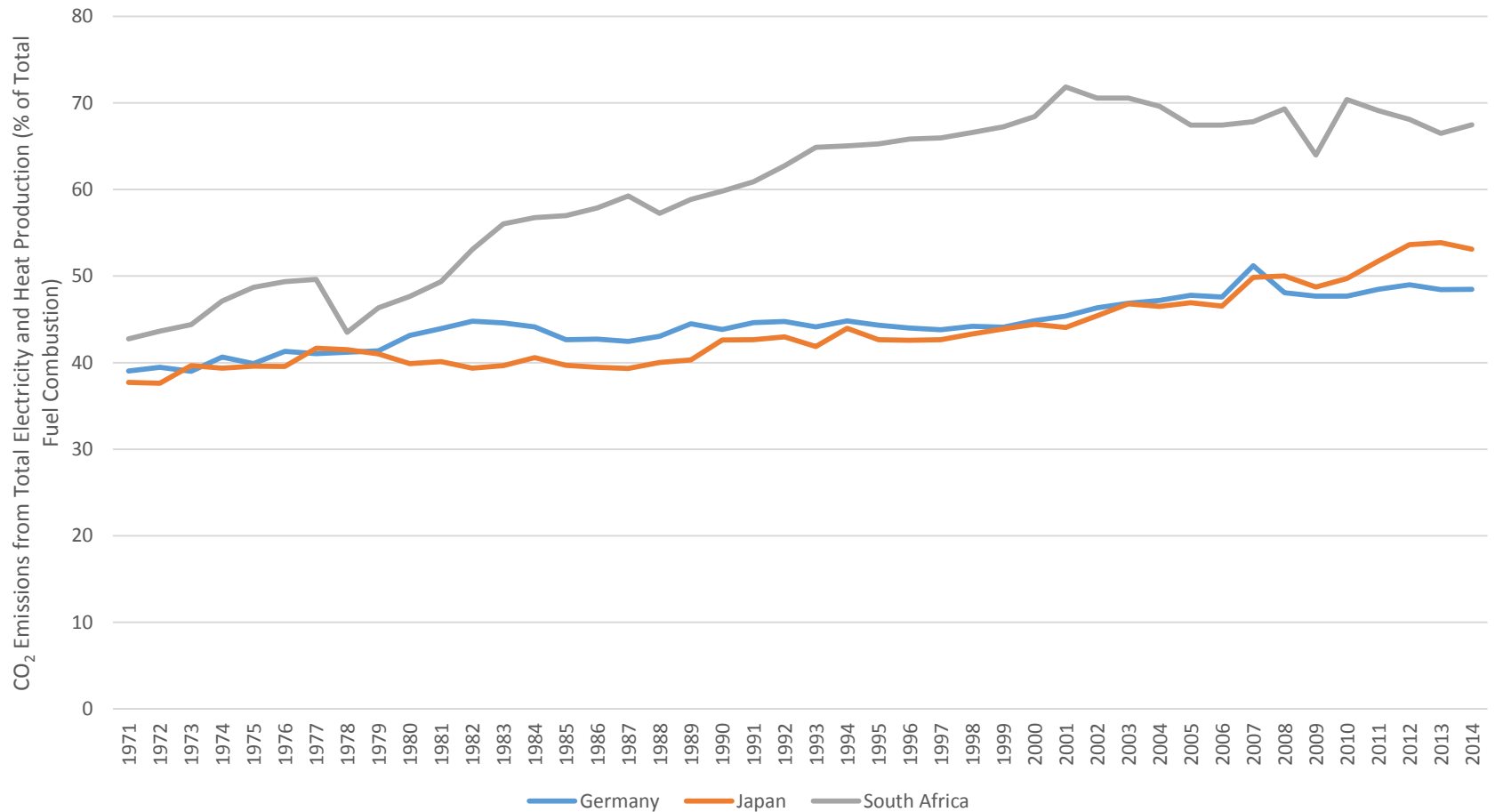
Infrastructure and a Low-Carbon Future

- Infrastructure underlies every aspect of the modern economy and consequently green infrastructure has knock-on benefits through its linkages with the rest of the economy, including, manufacturing, transport, and public services etc.
- Electricity is a key input in the modern world for almost every economic transaction and activity, which means the supply of renewable energy is crucial to the sustainability of all other sectors.
- The transition to a low-carbon future must be preceded by a dynamic move toward renewable energy sources for electricity production and not a mere augmentation of supply.
- Securing an ample supply of renewable energy is also key to social justice and providing opportunities for participation in social, political, and economic life moving forward.

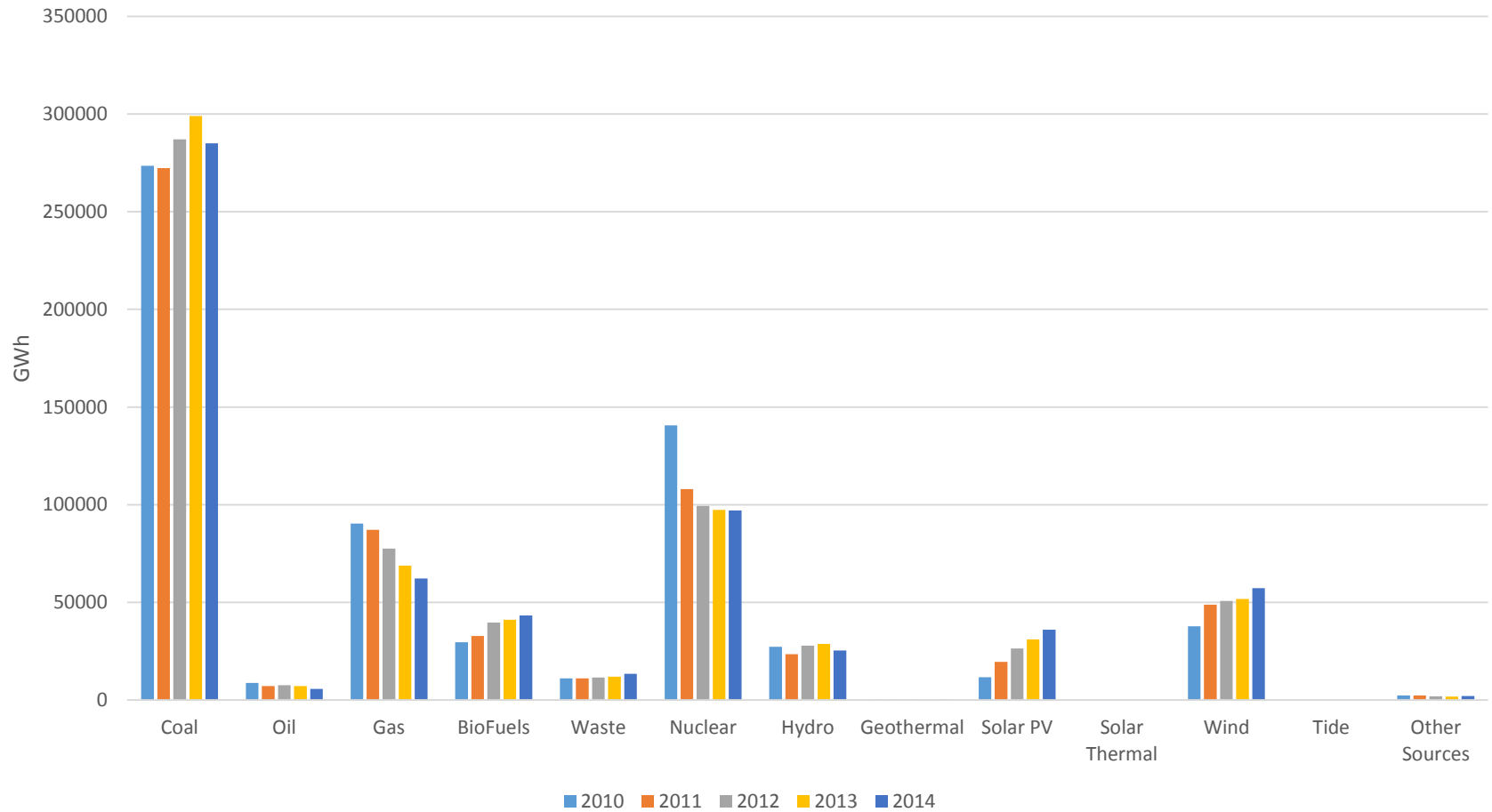
Caveats and Considerations

- Comparison of electricity infrastructure, electricity losses, and renewable energy in Germany, Japan, and South Africa.
- Granted, comparison with Germany and Japan might seem a bit unfair because they are further ahead in terms of social and economic development.
- Regardless, the point the comparison is to see where we are in relation to some of the best examples in the world of the renewable energy transition.
- Although the results seem like South Africa is not doing so well, it is commendable that the country has made the progress it has given its other priorities.

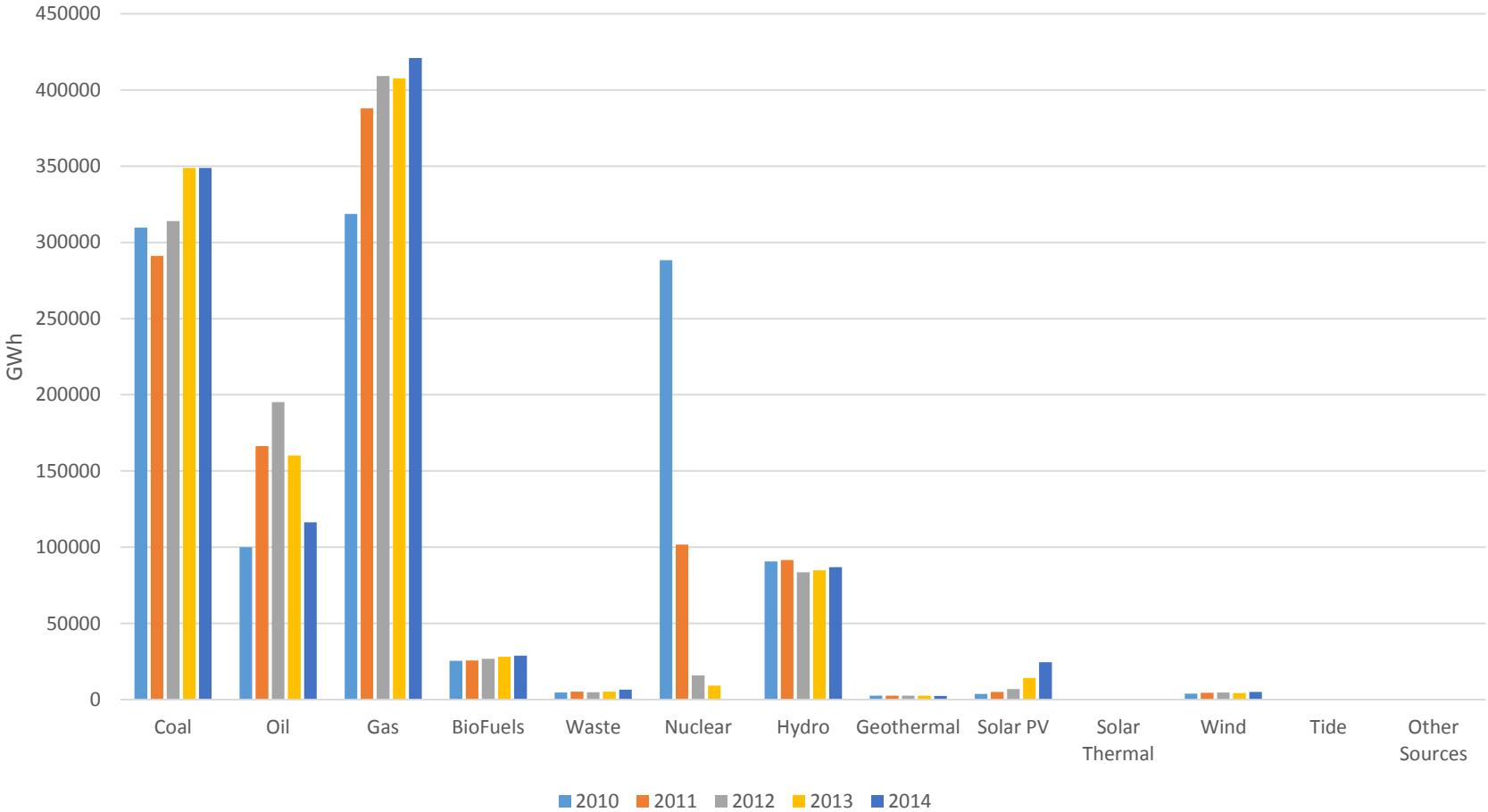
Electricity & Heat CO₂ Emissions Compared: Germany, Japan, and South Africa



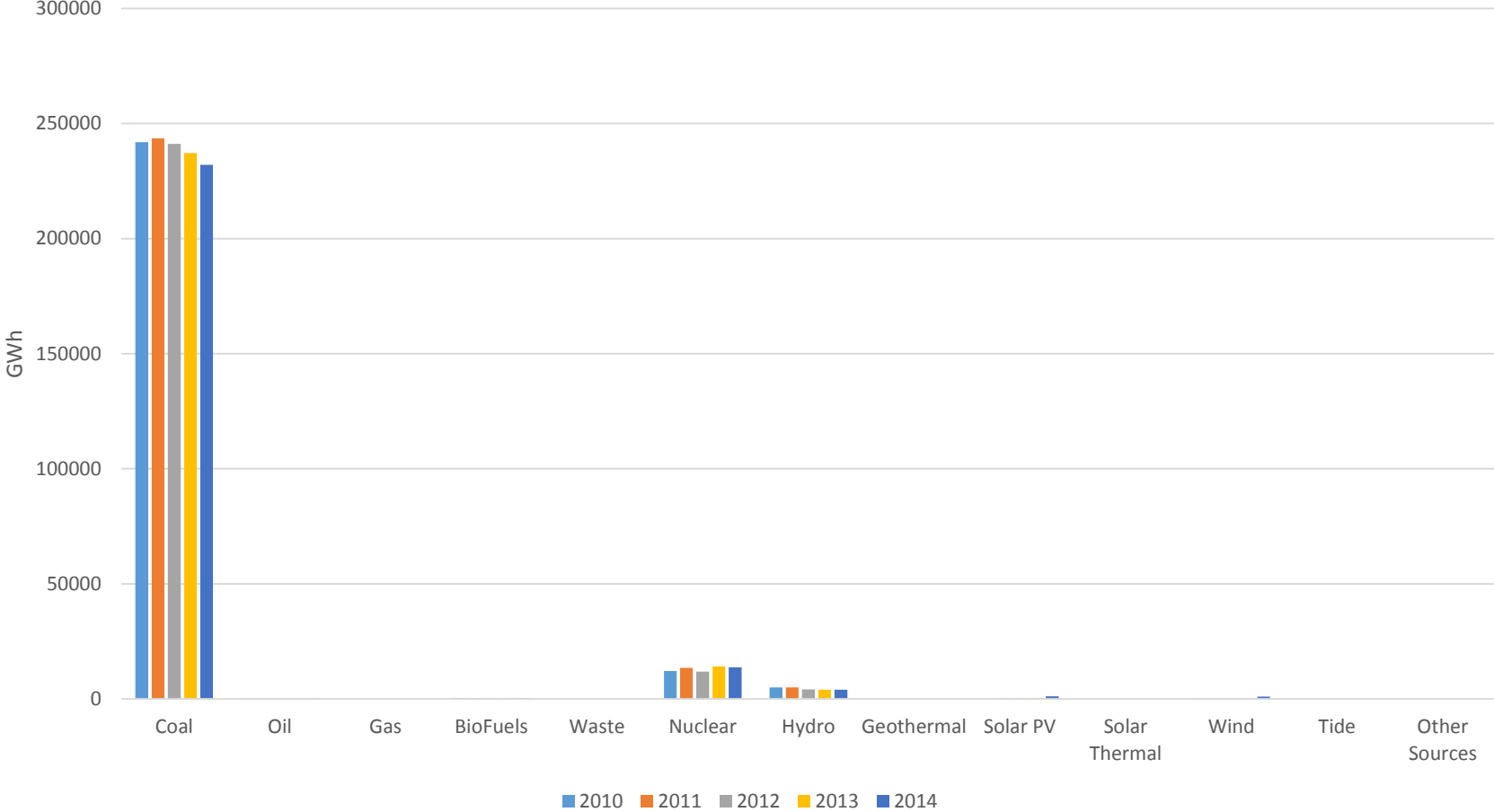
Electricity Basket Compared: Germany



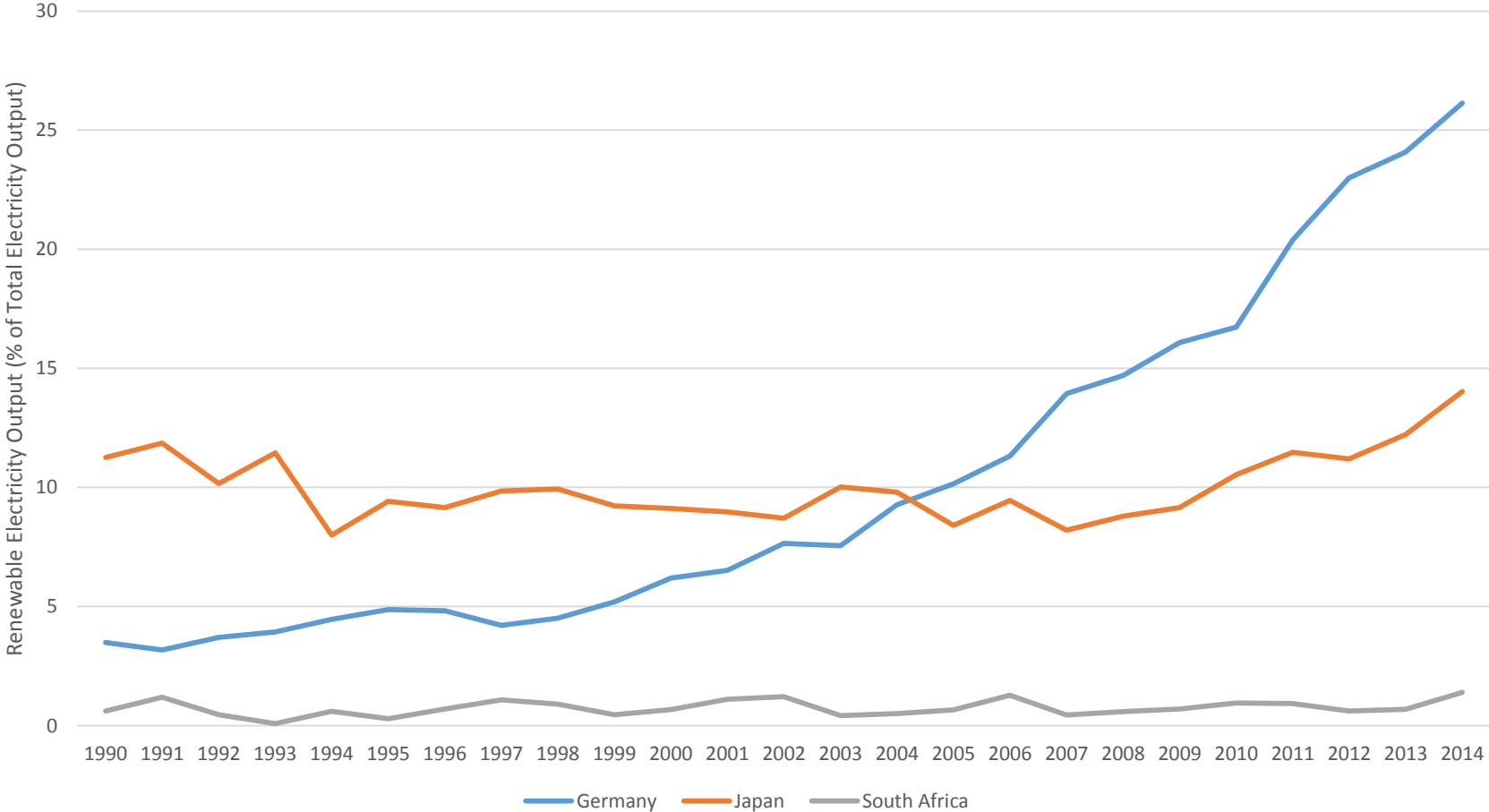
Electricity Basket Compared: Japan



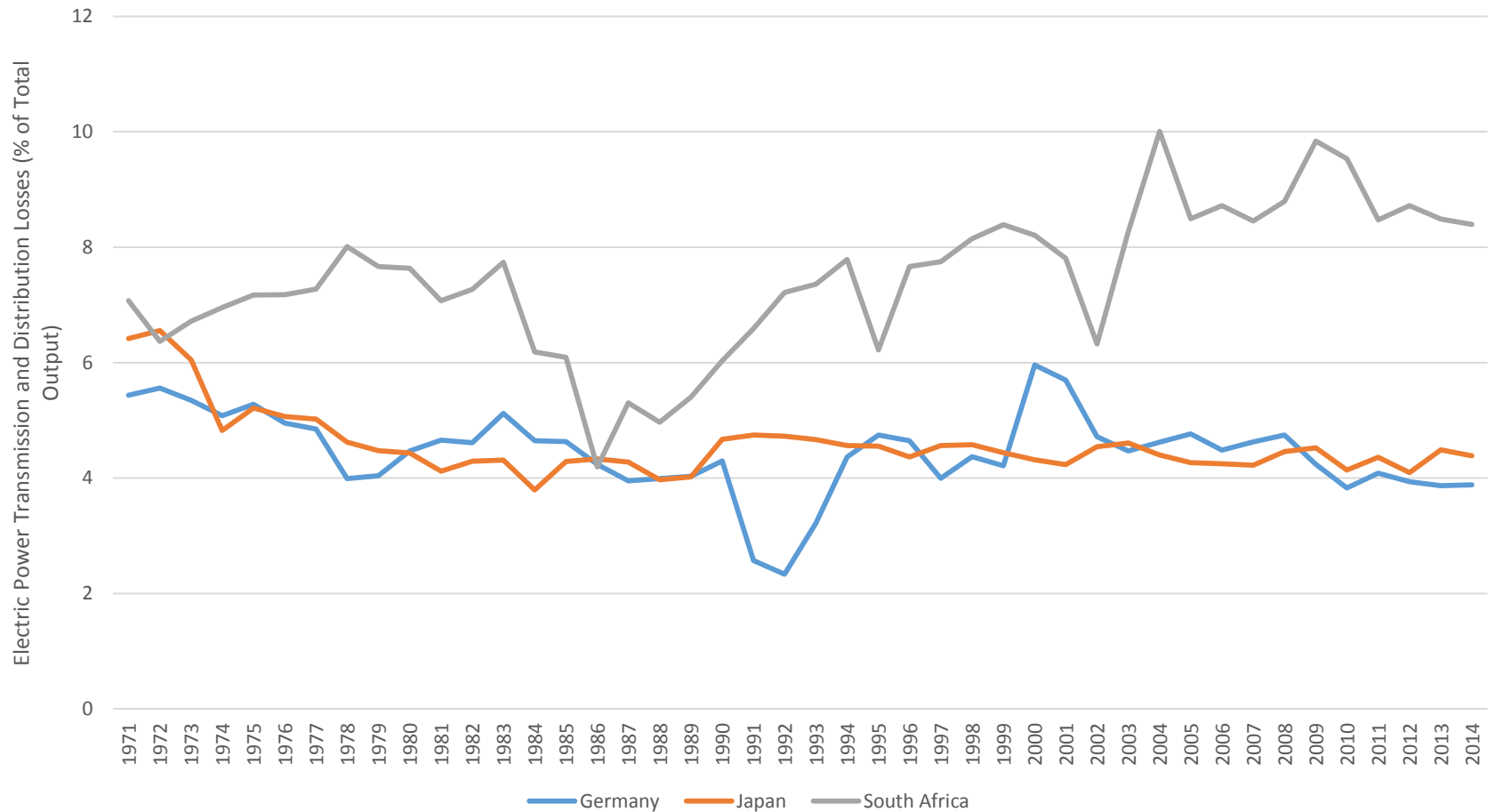
Electricity Basket Compared: South Africa



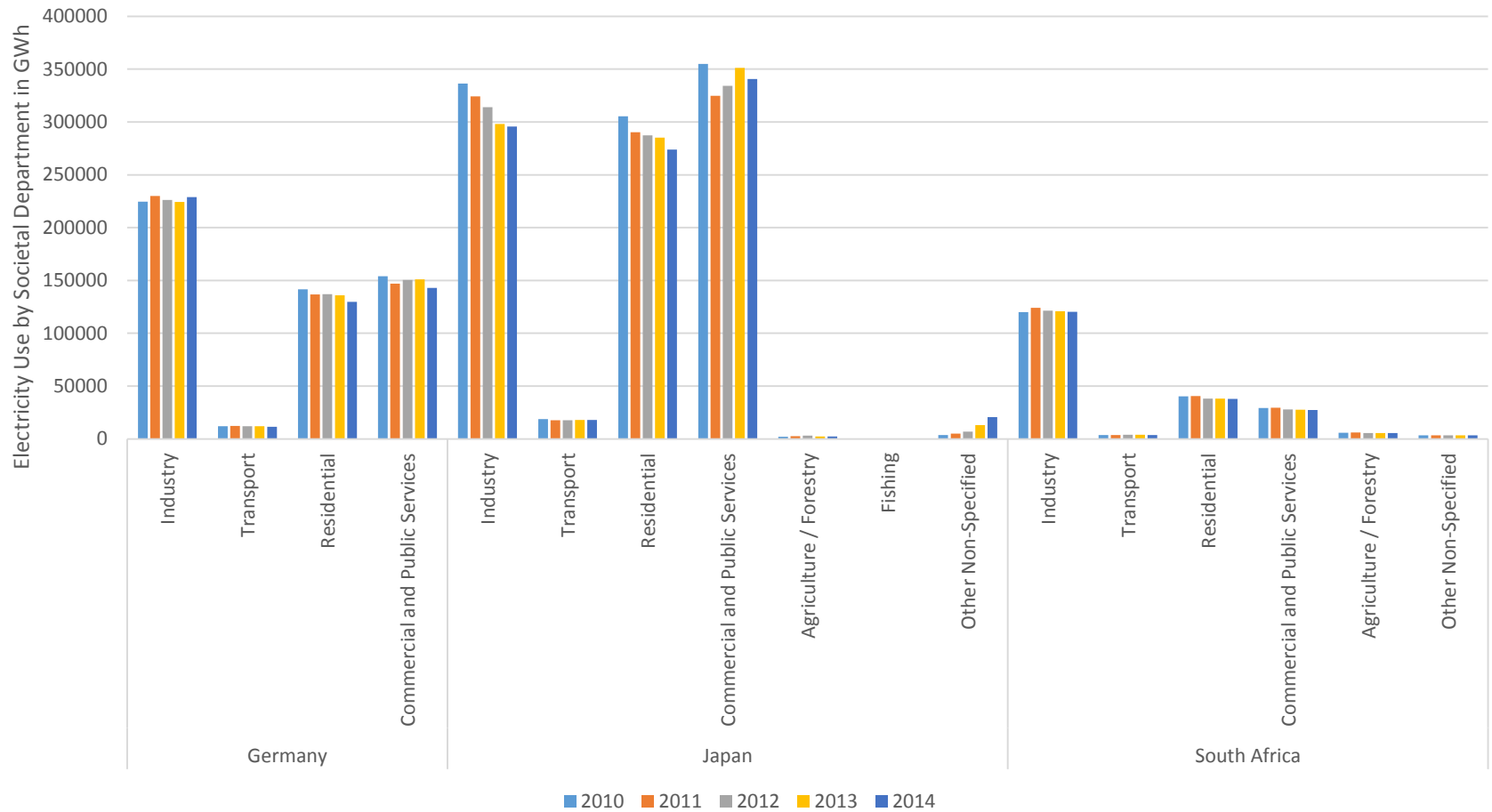
Renewable Electricity Output in Germany, Japan, and South Africa



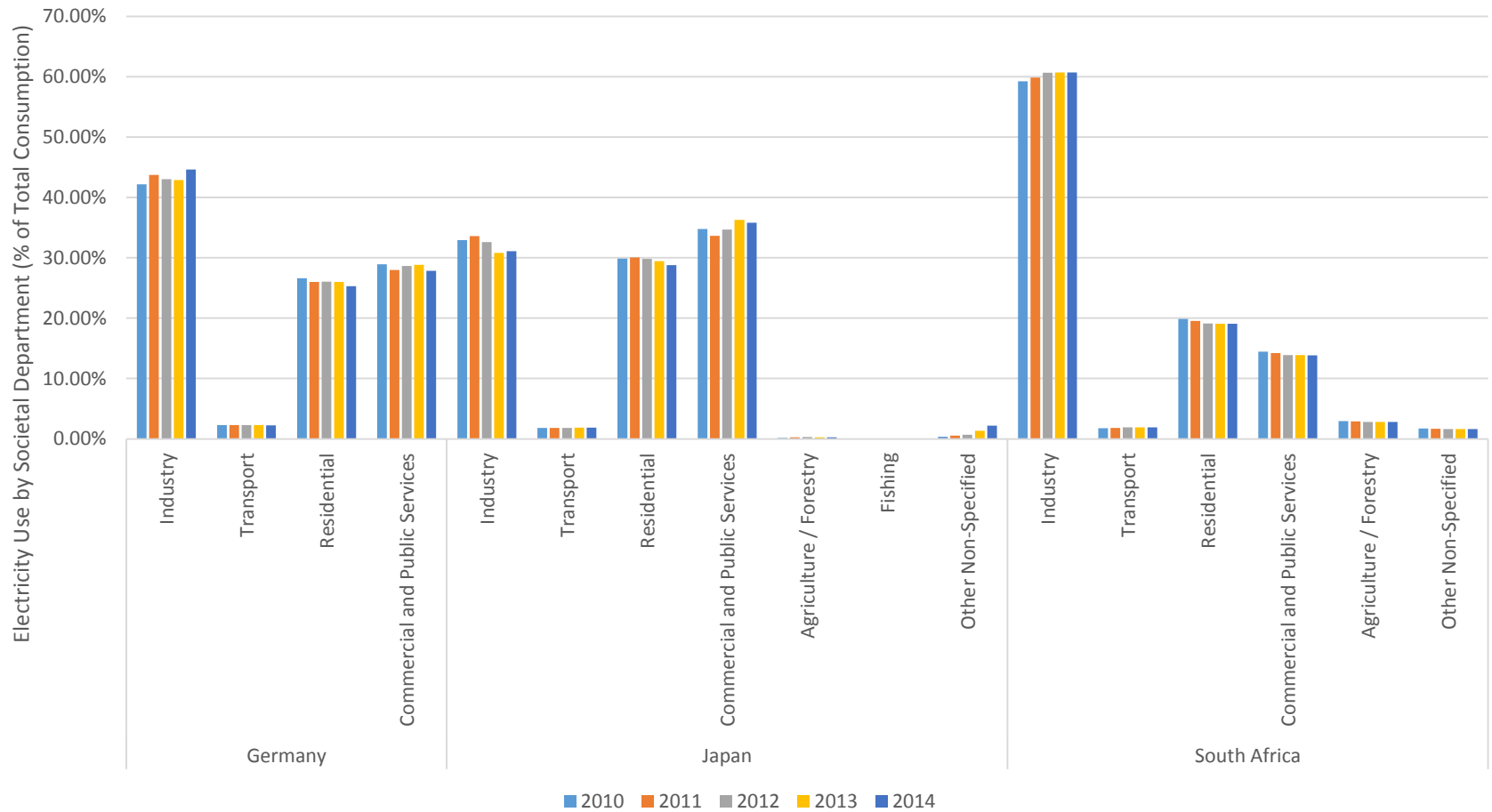
Electricity Losses in Germany, Japan, and South Africa



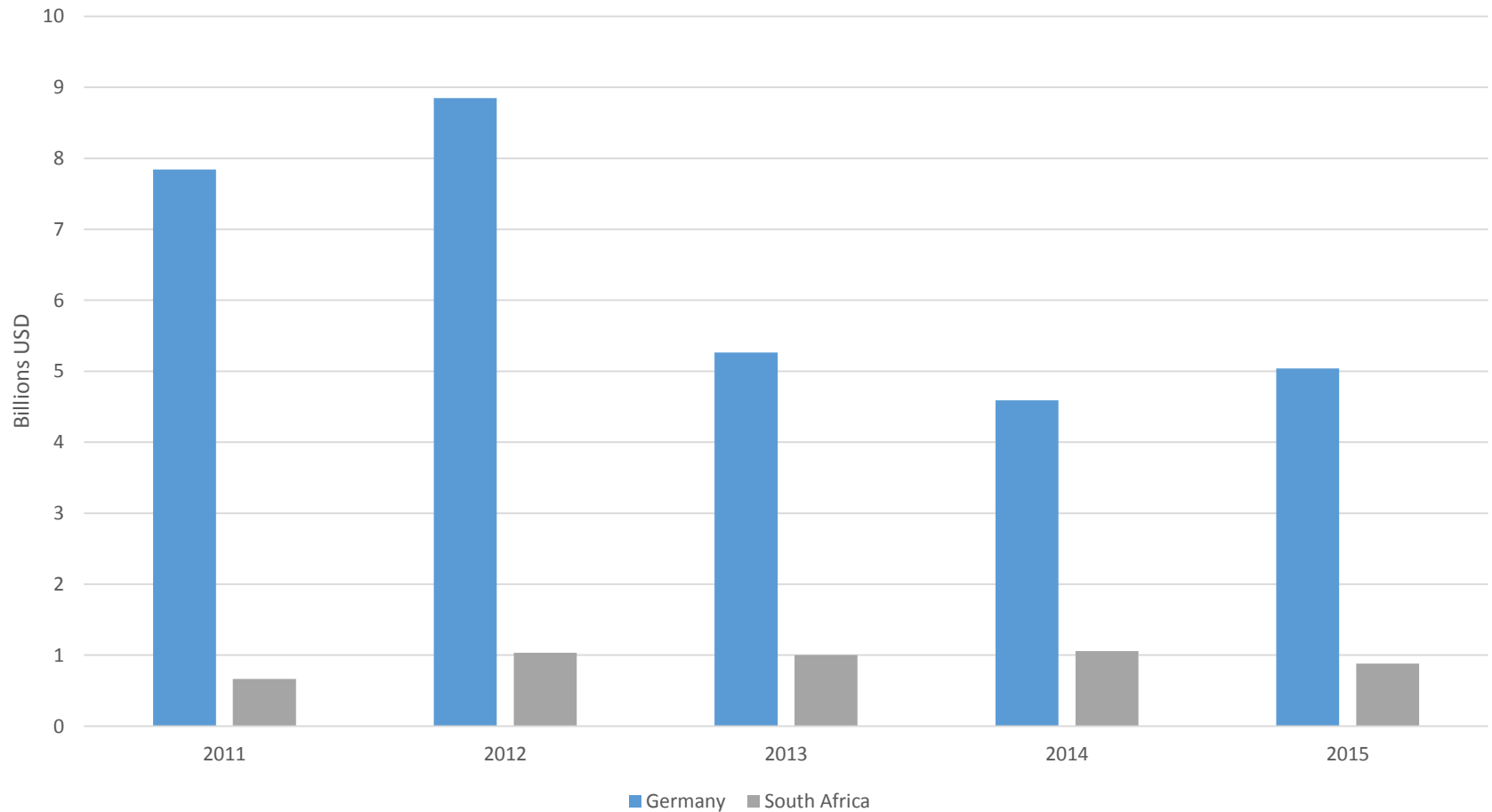
Electricity Consumption (GWh) in Germany, Japan, and South Africa



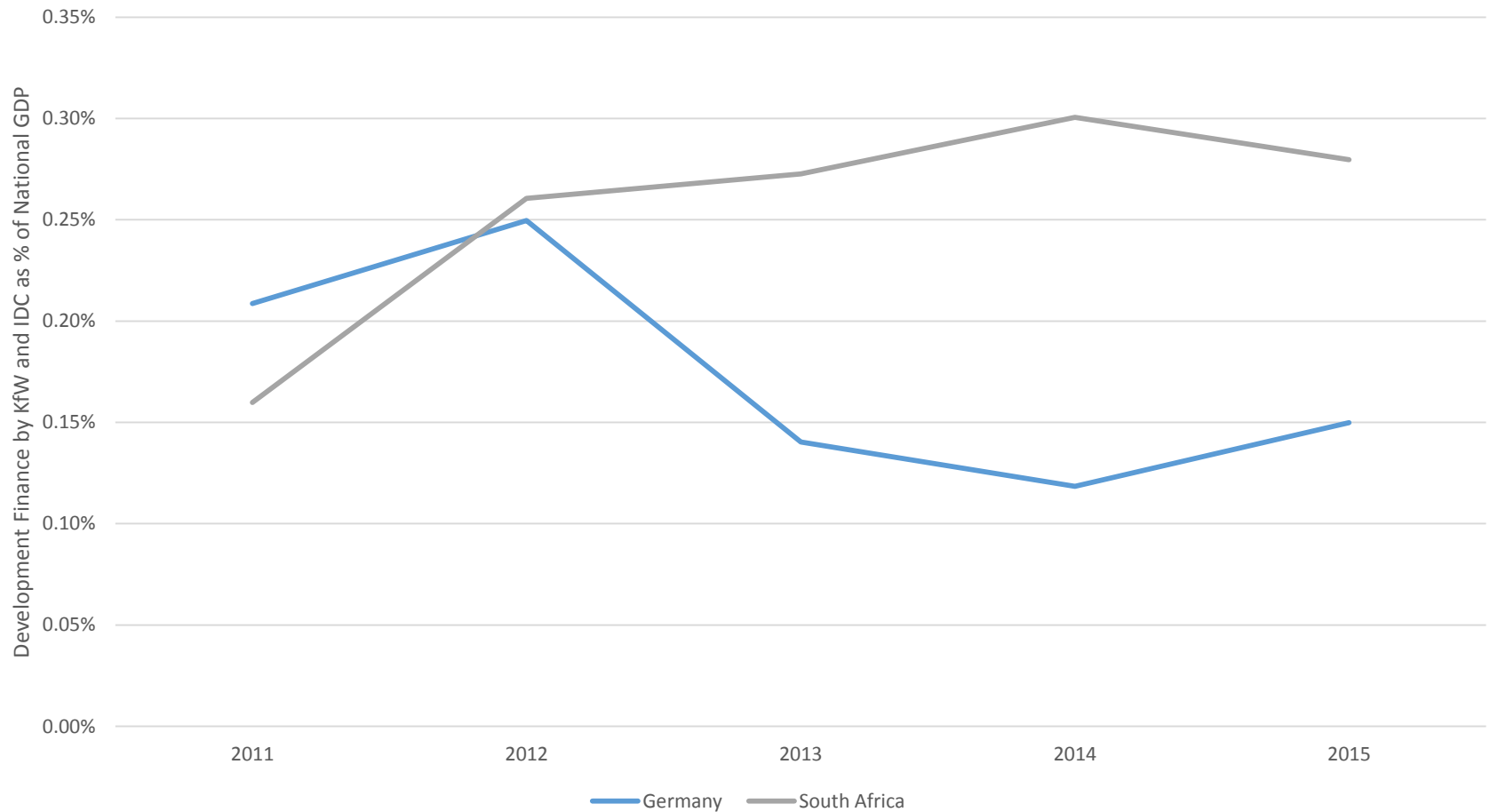
Electricity Consumption (% of Total) in Germany, Japan, and South Africa



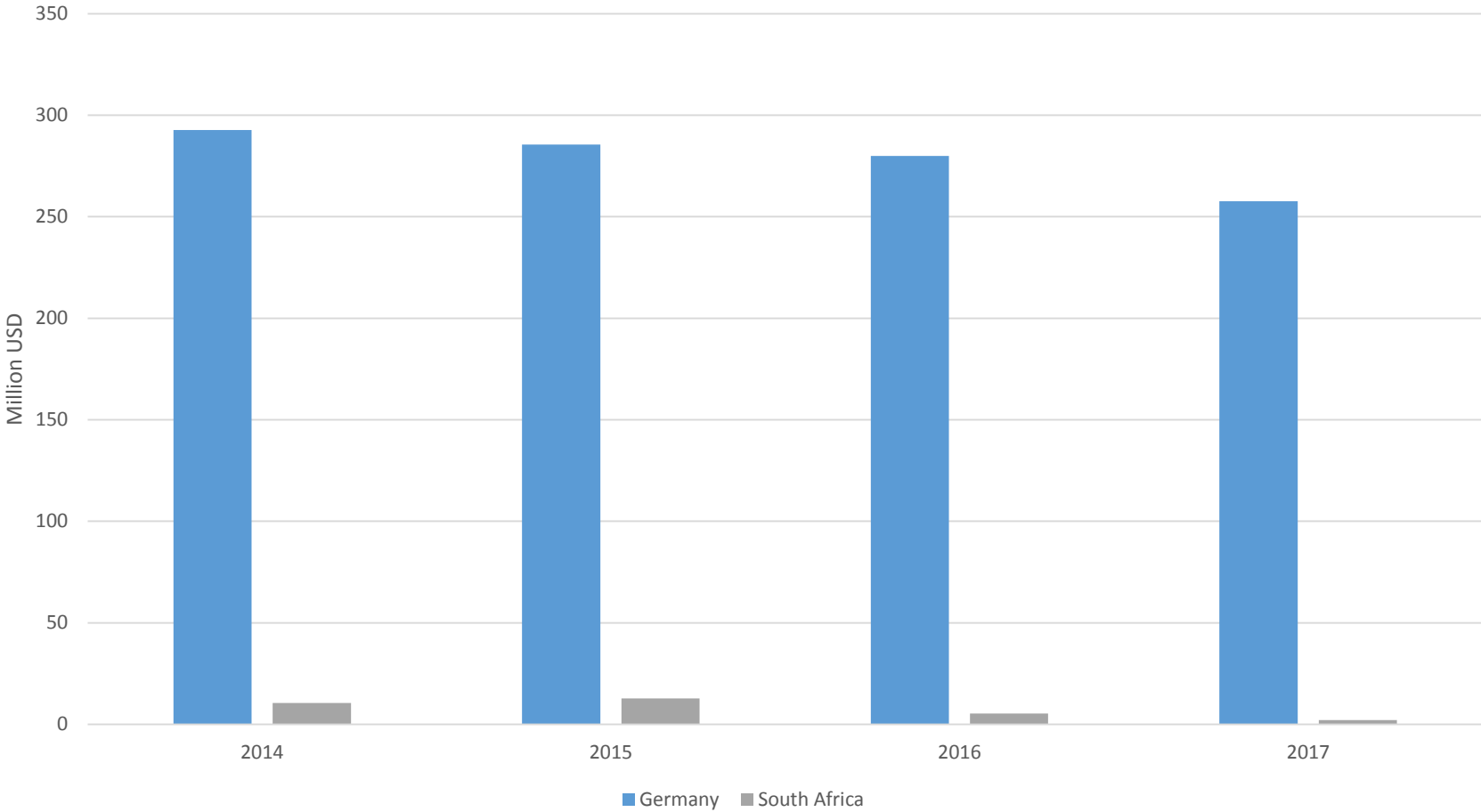
Development Finance on Renewable Energy Compared



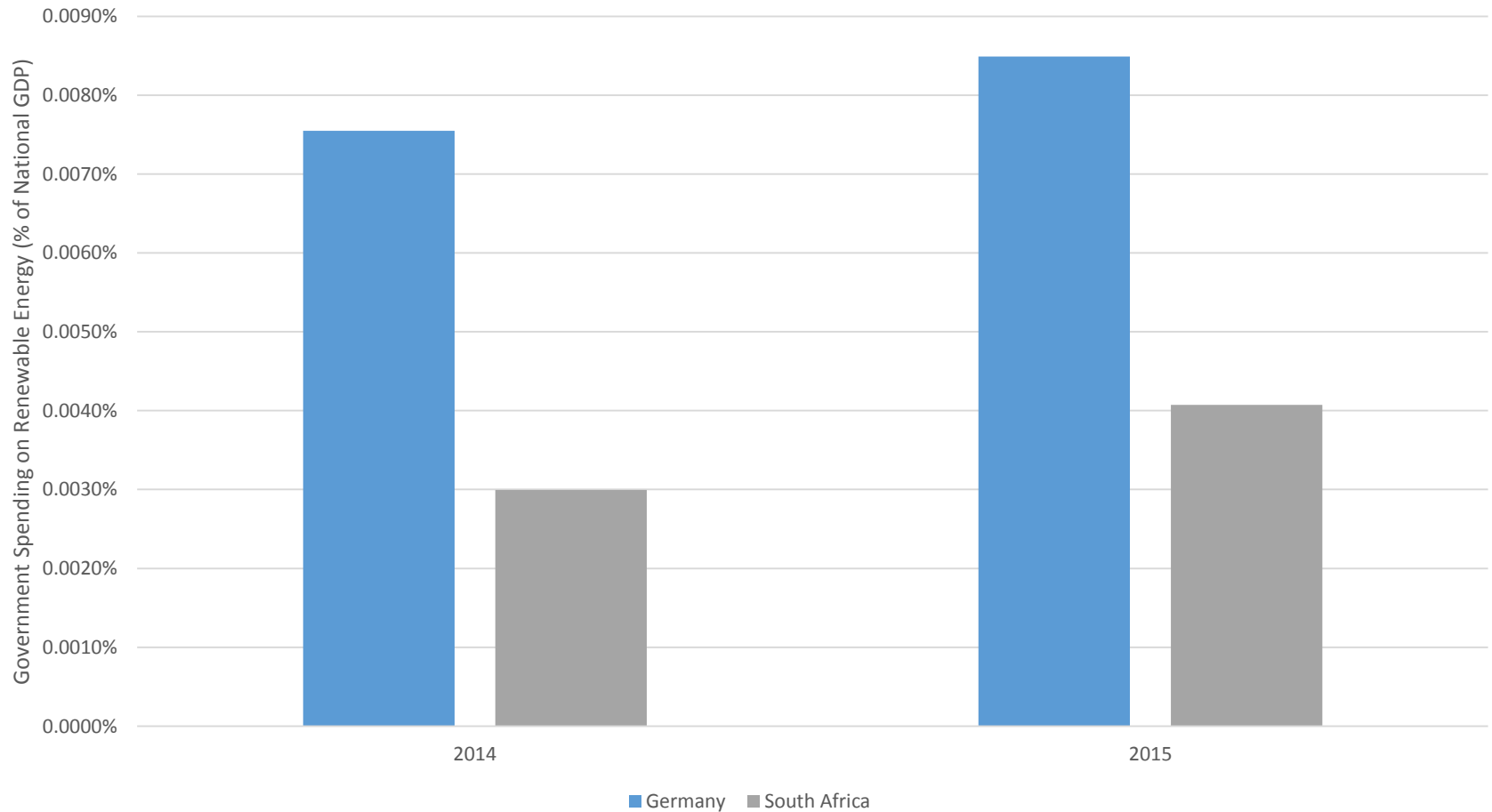
Development Finance on Renewable Energy Compared as % of National GDP



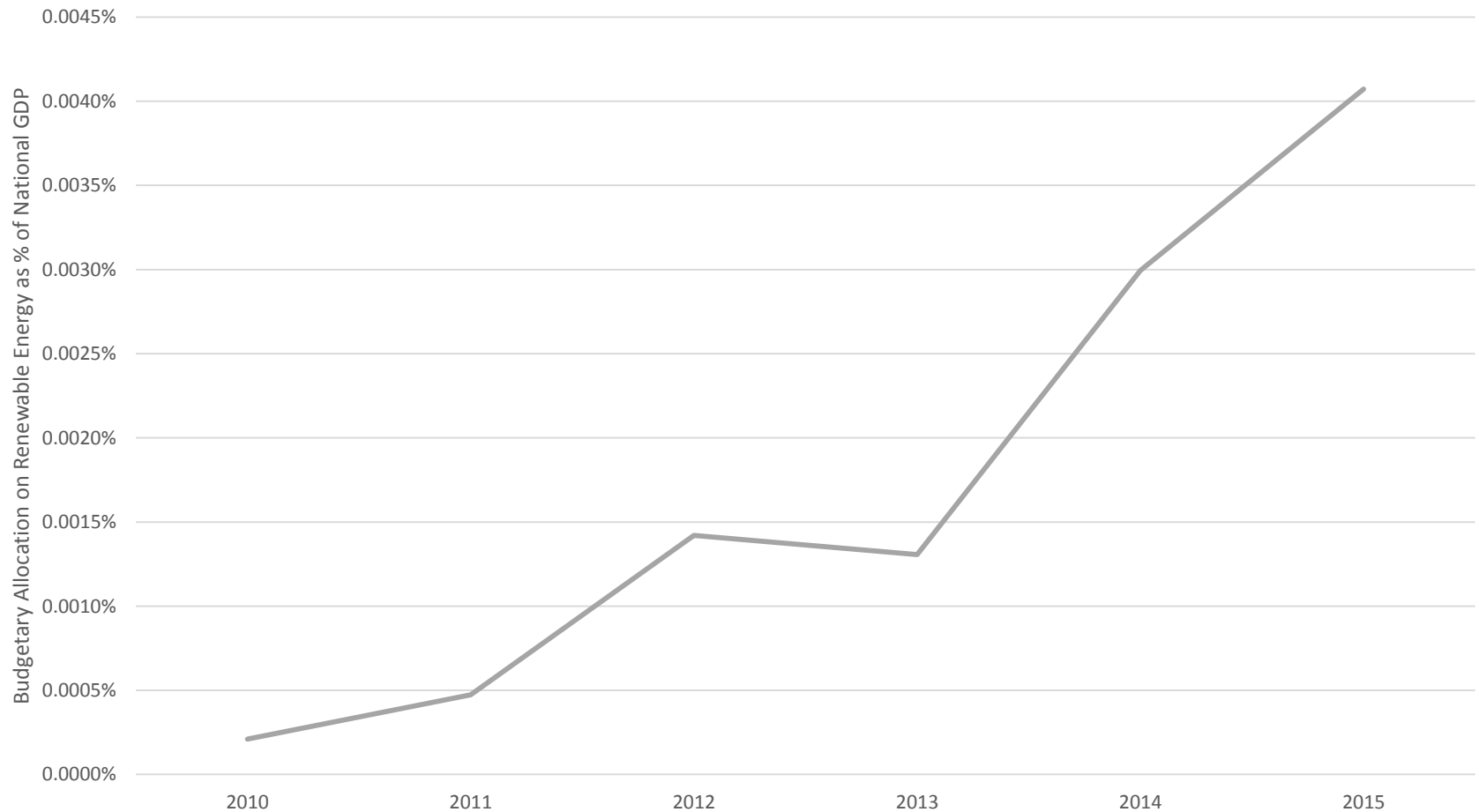
Government Finance on Renewable Energy Compared



Government Finance on Renewable Energy Compared as % of National GDP



South African Government Spending on Renewable Energy as % of National GDP



Other Sources of South African Financing and Renewable Energy Policy

- The New Growth Path and the National Development Plan prioritise renewable energy and aim to get 20,000 MWh from renewable energy sources.
- The South African Green Fund with budget of 1.1 billion ZAR has spent 204 million ZAR on renewable energy.
- Department of Energy initiatives on electricity efficiency and renewable energy.
 - “Sub-Programme 2.4: Electricity, Energy Efficiency and Environmental Policy”
 - “Sub-Programme 6.1: Energy Efficiency”
 - “Sub-Programme 6.2: Renewable Energy”
 - Combined Spend: 10.5 million ZAR (2015)
- The Renewable Energy Independent Power Producer Public Procurement (REIPPPP) programme.
 - 6 376 MWh of electricity procured from 102 renewable energy IPPs in six rounds of bidding.
 - 28 484 job years
 - 256.2 million ZAR in socio-economic development contributions
 - 80.5 million ZAR in enterprise development contributions
 - 30% Black South African Shareholding for the first three bidding rounds.

Findings

- South Africa has higher levels of CO₂ emissions from electricity than Germany and Japan and produces less electricity.
- South Africa's electricity provision basket is skewed toward coal, whereas Germany and Japan have a more balanced reliance of varied sources.
- Inefficiencies in South Africa's transmission and distribution system are causing double the energy losses compared to Germany and Japan.
- South African electricity from renewable energy sources is still small and signs of lock-in are evident from the reliance on coal.
- South Africa Development and Government financing compared to Germany is significantly less, but growing.
- Nevertheless, South African policy is making progress creating a supportive environment and promoting private buy-in.

Debates/Recommendations

- State-led/public utility based transitioning versus private buy-in approach.
- Vertically integrated versus decentralised with off-grid, mini-grid, and industry power self sufficiency initiatives.
- Multi-dimensional approach with greater government support, public utility component, private investment, on-grid and off-grid projects, and power self-sufficiency for appropriate industries (i.e. industries with backward linkages to agriculture and available bio-matter waste and by-products for generation heat and or decomposition related electricity).



Thank You!

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