

CHINA 2050: AN ENERGY EFFICIENT AND LOW CARBON ENERGY SYSTEM

IEA workshop on Enhancing the Impact of Energy Efficiency and Renewable Energy Policies 27/03/18

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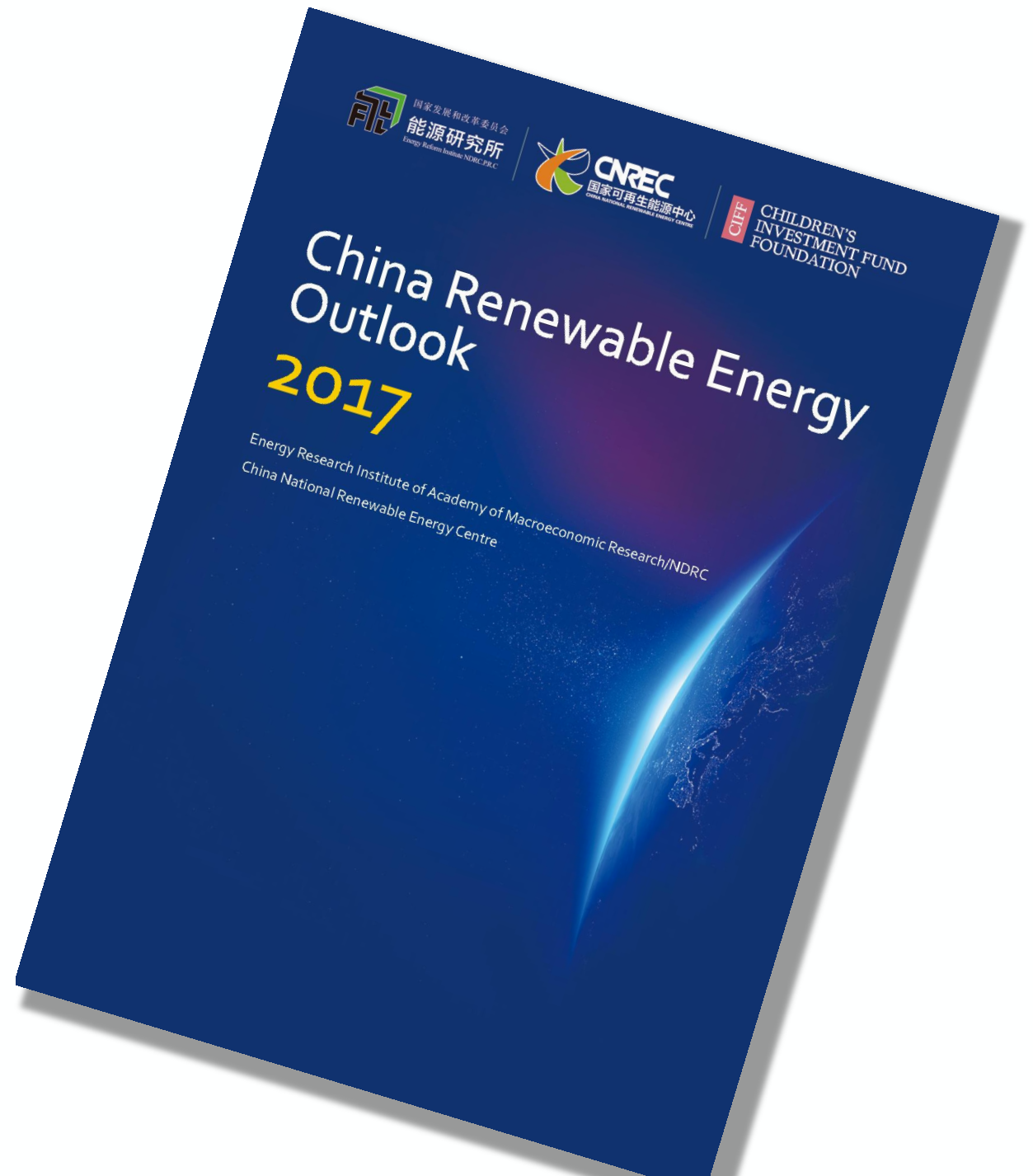


China will
“Build a clean, low-carbon, safe
and efficient energy system
to provide a solid energy
guarantee for economic and social
development and a better life for
the people”

But how?

Comprehensive energy system
analyses for China 2017-2050

Two main scenarios:
Stated Policies scenario, and
Below 2 °C scenario



It is possible to have economic growth and at the same time lower energy consumption

GDP 2050 3.8 times GDP 2016

2016

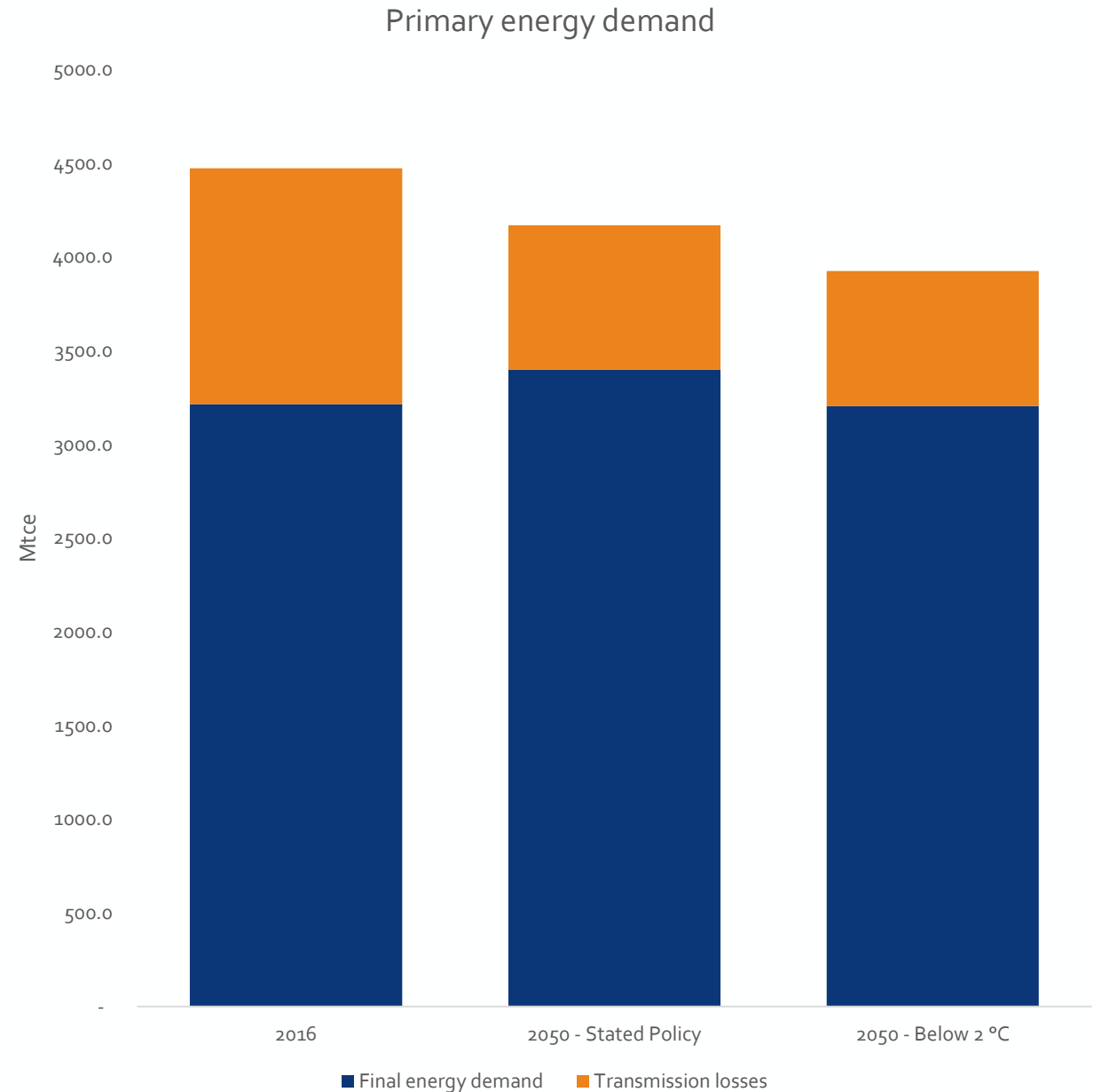


74 413 billion RMB
11 203 billion USD
53 974 RMB/person
8 126 USD/person

2050



282 000 billion RMB
42 455 billion USD
204 348 RMB/person
30 765 USD/person



Transformation of the economy from high energy to low energy intensity sectors

2050 energy consumption

🏭 Industry sector half of 2016 consumption

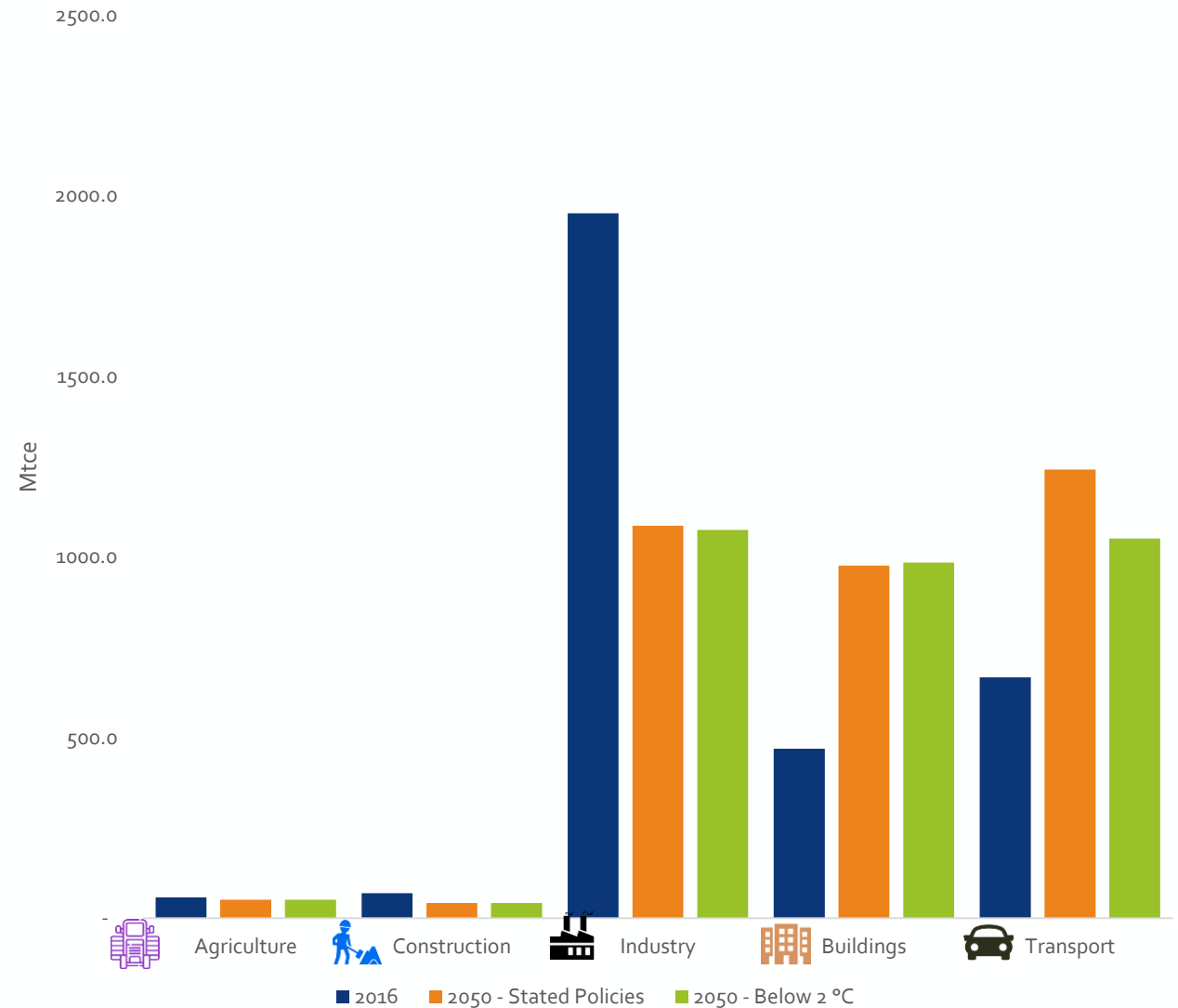
🏠 Building sector double of 2016

🚗 Transport sector higher

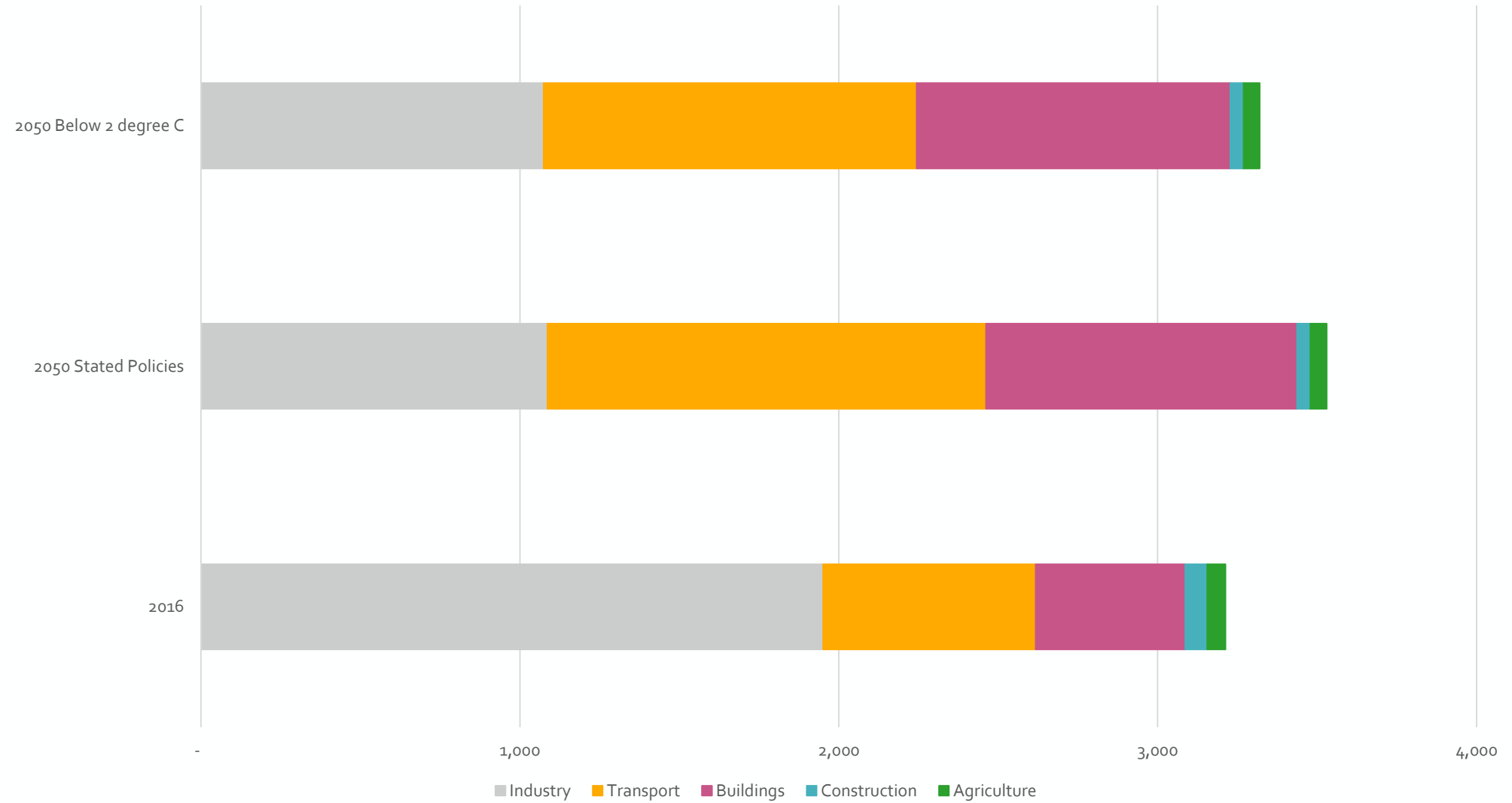
In total

- the final energy consumption is the same in 2050 as in 2016

Energy consumption in the end-use sectors



Final energy demand on sectors (Mtce)



Electrification of industry and transport reduces losses in the end- use consumption

A shift from coal to electricity in industry and buildings improves the energy efficiency in the end-use sector.

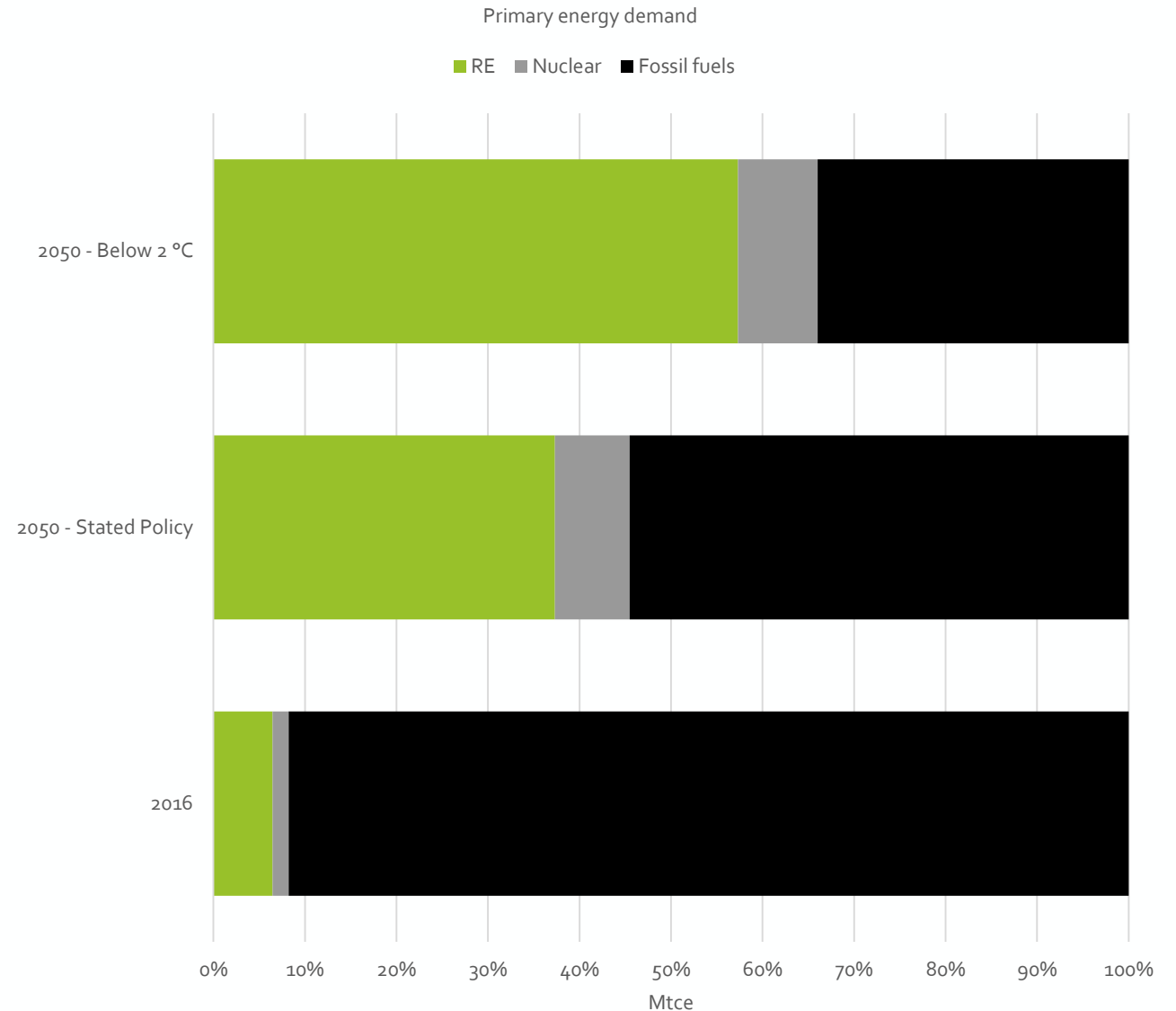
In 2050 electricity covers **41%** of the final energy consumption in the Stated Policy scenario and **53%** in the Below 2 °C Scenario compared to **19%** in 2016



High share of renewable energy with no transformation losses

Wind turbines and Solar PV produce electricity without losses, while thermal power plants have high losses in the transformation from fuel to electricity. A high share of RE in the power supply in 2050 lower the total energy consumption significantly.

The share of RE in the primary energy demand in 2050 is **37% (56%)** in the Stated Policy scenario and **57% (77%)** in the Below 2 °C scenario (figures in () calculated using coal substitution methodology)



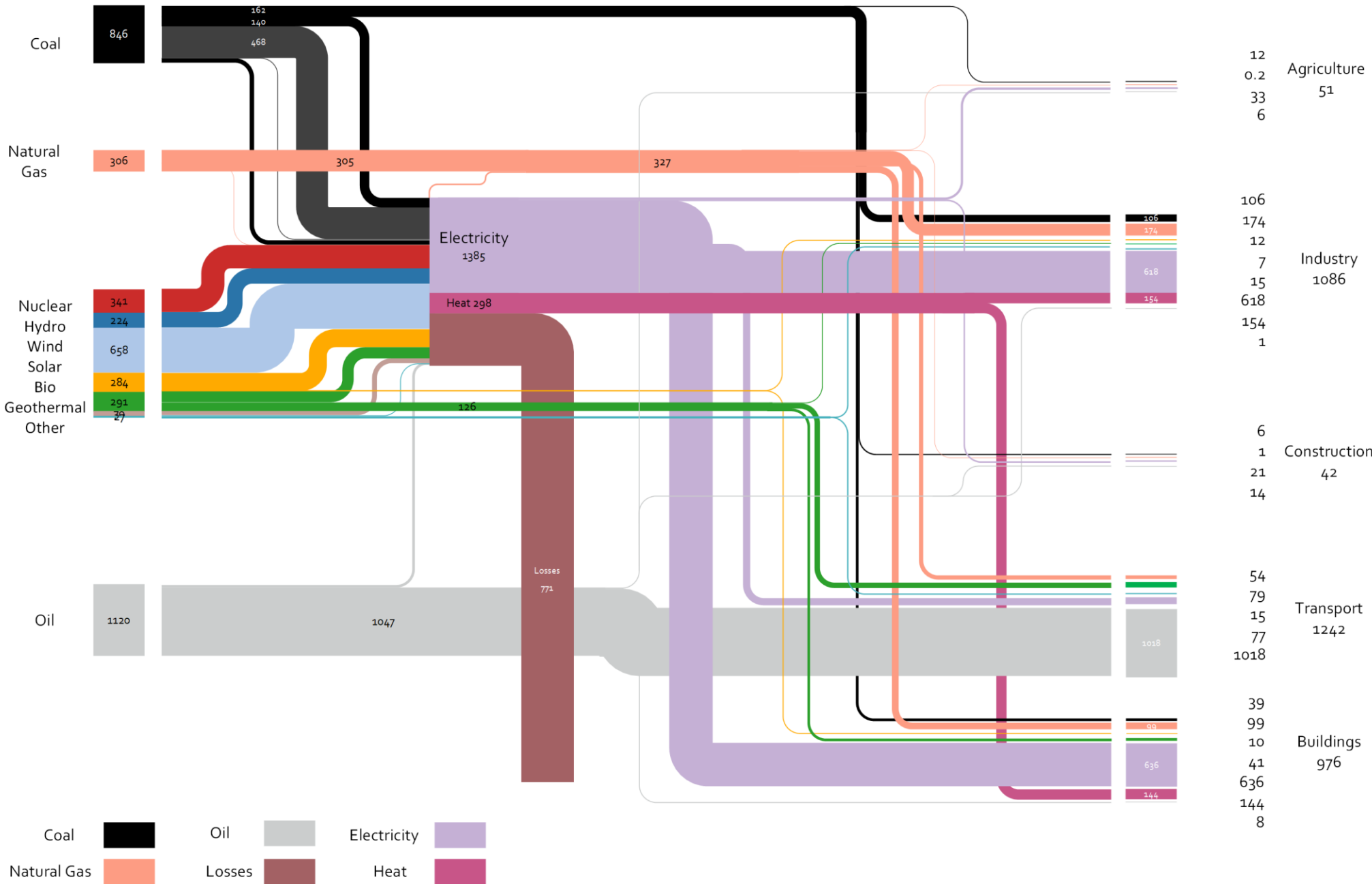
In 2016 the Total Primary Energy Consumption amounted **4360 Mtce** and the Final Energy Demand amounted **3213 Mtce**



2050 Stated Policies

In 2050 in the Stated Policies scenario the Total Primary Energy Consumption amounts **4168 Mtce** and the Final Energy Demand amounts **3397 Mtce**

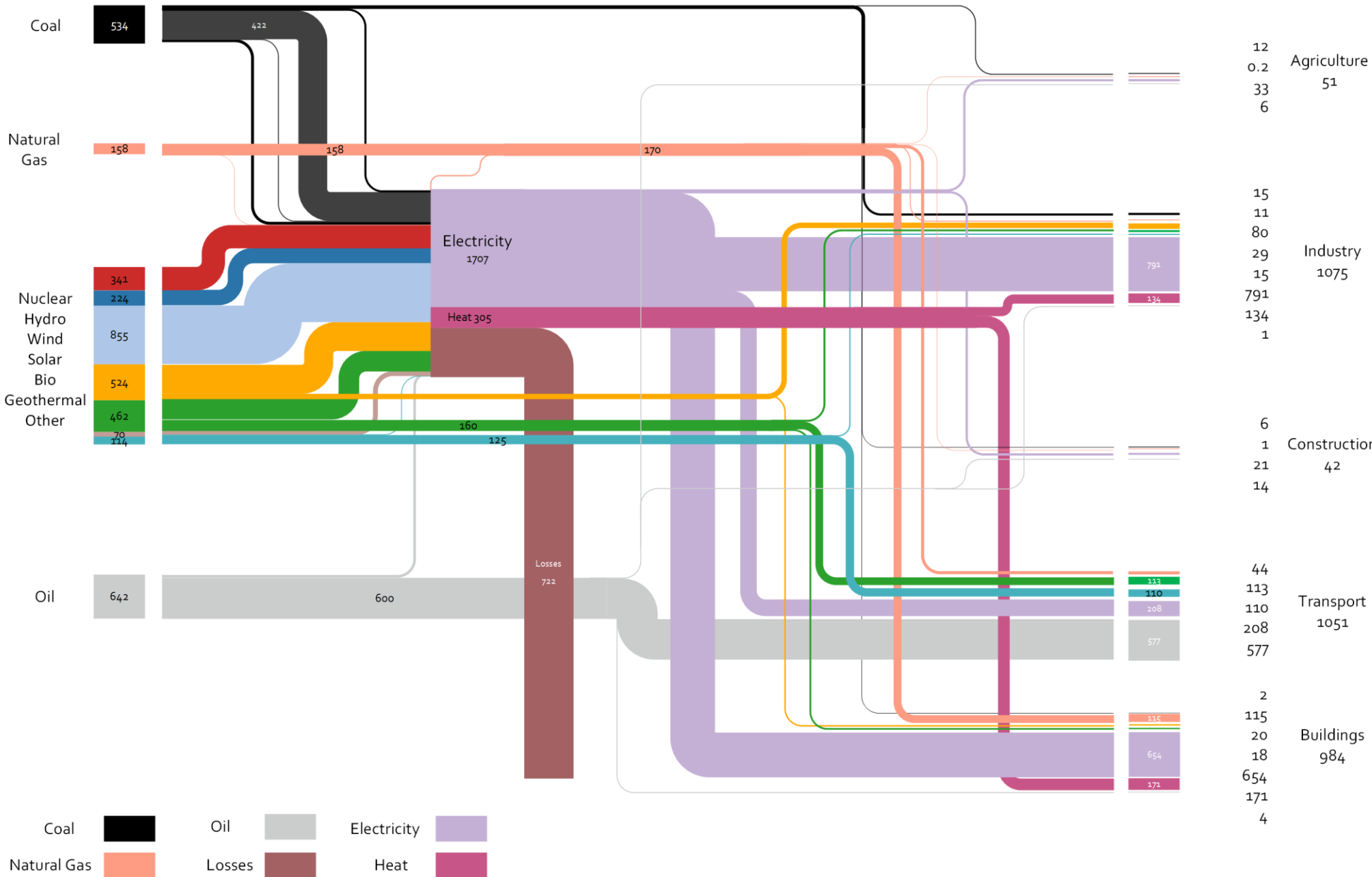
2050 Energy flow chart Stated policies (Mtce)



2050 Below 2 °C Scenario

In 2050 in the Below 2 °C scenario the Total Primary Energy Consumption amounts **3924 Mtce** and the Final Energy Demand amounts **3202 Mtce**

2050 Energy flow chart Below 2°C (Mtce)



CO₂-emission

The CO₂-emission is reduced in 2050, mainly due to the reduction in the use of coal.

In 2050 the CO₂-emission is **5,156 Mton** in the Stated Policy scenario and **3,056 Mton** in the Below 2 °C scenario compared to **10,167 Mton** in 2016

