INEVITABLE POLICY RESPONSE

Inevitable Policy Response 1.5°C Required Policy Scenario 2021 (IPR RPS 2021):
Macroeconomic results

Preparing financial markets for climate-related policy and regulatory risks

January 2022

IPR was commissioned by the Principles for Responsible Investment (PRI) and supported by world class research partners and leading financial institutions

PRI Principles for Responsible Investment

PRI commissioned the Inevitable Policy Response in 2018 to advance the industry's knowledge of climate transition risk, and to support investors' efforts to incorporate climate risk into their portfolio assessments

:vivideconomics putting economics to good use

Energy Transition Advisors ETA

A research consortium led by Energy Transition Advisors and Vivid Economics conducts the initiative's policy research and scenario modelling and includes 2Dii, Carbon Tracker Initiative, Climate Bonds Initiative, Quinbrook Infrastructure Partners and Planet Tracker

The consortium was given the mandate to bring leading analytic tools and an independent perspective to assess the drivers of likely policy action and their implications on the market

Planet Tracker

quinbrook infrastructure PARTNERS

2investing initiative

Carbon Tracker Initiative

Climate Bonds Initiative

Who supports the Inevitable Policy Response ?

Leading financial institutions joined the IPR as Strategic Partners in 2021 to provide more in-depth industry input, and to further strengthen its relevance to the financial industry

BLACKROCK

FitchRatings

nuveen
A TIAA Company

BNP PARIBAS
ASSET MANAGEMENT

Goldman Sachs Asset Management

Core philanthropic support has been provided since 2018. The IPR is funded in part by the Gordon and Betty Moore Foundation through The Finance Hub, which was created to advance sustainable finance, and the ClimateWorks Foundation striving to innovate and accelerate climate solutions at scale

GORDON AND BETTY MOORE FOUNDATION

THE FINANCE HUB

climateworks FOUNDATION

The IPR offers a range of applications to help navigate the climate transition

IPR Policy Forecast

A **high-conviction policy-based forecast** of forceful policy response to climate change and implications for energy, agriculture and land use

IPR Forecasted Policy Scenario (FPS)

A **fully integrated climate transition scenario** modelling the impact of the forecasted policies on the real economy up to 2050, tracing detailed effects on all emitting sectors

IPR 1.5°C Scenario

A 1.5°C '**Required Policy Scenario'**(RPS) building on the IEA NZE by deepening analysis on policy, land use, emerging economies, NETs and value drivers. This can be used by those looking to align to 1.5°C

IPR Value Drivers

A set of publicly available **outputs from the FPS and 1.5°C RPS** that offer significant granularity at the sector and country level allowing investors to assess their own climate risk

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IPR's Forecast Policy Scenario (FPS) value add

A high conviction policy-based forecast, anchored in realistic policy and technology expectations rather than hypothetical 'optimal' pathways

Complete forecast includes macroeconomic, energy and land use models linking crucial aspects of climate across the entire economy

Transparent on expectations for policy and deployment of key technologies, such as Negative Emission Technologies

Covers all regions of the world, with specific policy forecasts for key countries and regions

Applicable to TCFD reporting and regulatory stress testing, with a 1.5°C Required Policy Response (RPS) scenario being developed for late 2021

Fully integrating land-use to examine the full system impacts of policies, and highlight the critical role of land

A 1.5°C '**Required Policy Scenario'** (RPS) has also now been developed building on the IEA NZE, deepening analysis on land use and deriving polices required to reach a rapid Net Zero 2050 outcome

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Note: IPR does not model physical risk

The Inevitable Policy Response: IPR 1.5°C RPS

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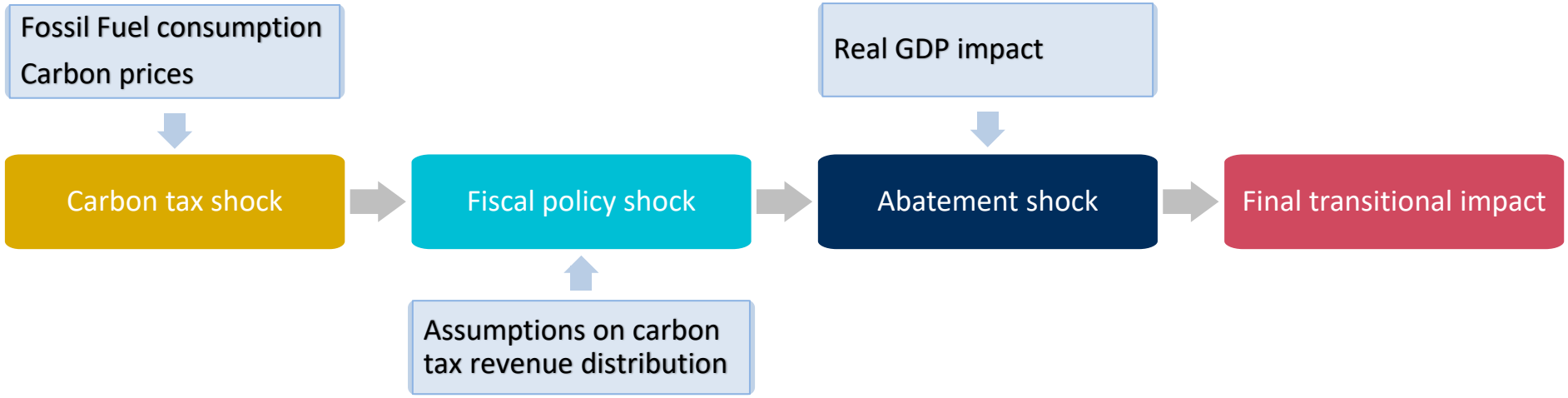
Vivid Economics projected macroeconomic variables in collaboration with the National Institute for Economic and Social Research (NIESR)

Vivid Economics worked with NIESR to expand the results from Vivid Economics' energy models into macroeconomic variables across different economies using a variety of shocks. None of the modelled shocks include physical risks.

Vivid Economics/NIESR implemented the following shocks using the National Institute Global Econometric Model (NIGEM):

- Carbon tax shock: it introduces a carbon tax in the economy. It flows through inflation directly based on the emissions levels and carbon prices by country/region. As a result of rising carbon taxes, consumption of Fossil Fuels (FF) demand decline with impact to countries/regions that export FFs. The basket imports prices changes to reflect a decline in in FF consumption.
- Fiscal shock: once the carbon tax is introduced in each economy it generates additional revenues to the government. The amount of revenues depend on the emissions and the carbon prices in each country/region. Revenues are distributed with the following allocations: 40% to payoff debt, 30% as household transfers, and 30% as government investment.
- Abatement shock: a supply shock to the economy. This is the real GDP cost of a costlier energy system of decarbonizing the economy (OPEX and CAPEX across eight technologies). Abatement cost were produced by Vivid Economics.



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Each shock has unique drivers based on the inputs and modelling options available in NIGEM

Carbon tax shock drivers

- Carbon prices: increased price for all countries/regions but at different speeds. Sharper rises would have larger impacts on inflation.
- FF emissions profile: countries with higher emissions would expect to see larger inflationary impacts.
- NIGEM applies the carbon tax to the inflation equation, import prices, and FF export market shares.

Fiscal shock

- Revenues are recycled through debt repayments, government investment, taxes, and household transfers.
- Differences in the tax base (personal vs corporate) in each country will create differences in the impact of the fiscal shock.
- Countries with higher carbon prices or emission may accumulate larger carbon revenues.

Abatement shock

- Abatement impacts (CAPEX and OPEX) depend on the cost of technologies relative to the cost of fossil fuels in each country (set outside NIGEM).
- These cost have been calculated by Vivid Economics Energy Modelling team.

Cumulative Transitional Impacts

- Impacts are presented below as the percentage (absolute) difference against baseline. This baseline was constructed as a hypothetical counterfactual to the RPS and FSP scenarios. We presented high level commentary for a few macroeconomic variables.

Monetary policy

- Monetary policy is determined within the model based on a two-pillar rule targeting Nominal GDP and Inflation rate.

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Key findings

IPR Energy results

- Economies decarbonise at different speeds; OECD countries tend to decarbonise early on the scenario. Most Non-OECD countries decarbonise only after 2030 (including FFDC).
- Carbon prices increase for all countries but at different speeds based on their policy ambitions. Countries with ambitious decarbonisation policies, raise carbon prices earlier.
- Under RPS 100% clean power is achieved by 2045, much earlier than in FPS.

IPR macroeconomic impacts

- Macroeconomic impacts were modelled using NIGEM a quarterly macro-econometric model. The model introduced a series of transitional shocks. This included the introduction of a carbon tax shock, a fiscal shock that recycles carbon tax revenues, and an abatement shock which represents the economic costs of a costlier energy system (see appendix).
- In both IPR scenarios (RPS and FPS) there are short- and medium-term economic costs (lower real GDP and higher inflation compared to the baseline) but most of these impacts dissipate over time. Non-OECD and FFDC see worse outcomes compared to OECD countries in both inflation and real GDP under both FPS and RPS.
- A high conviction scenario like RPS doesn't necessarily yield worse long-term outcomes when compared to FPS, making an ambitious transformation of energy systems economic neutral by 2050 (see accompanying RPS slide pack).
- The RPS scenario show significant frontloaded abatement cost which has an impact on real GDP and inflation compared to the FPS.
- Unemployment rate only see minor differences compared to baseline as a result of moderate changes in real GDP.
- Long term interest rates react moderately to monetary policy rate hikes to contain inflationary pressures early in the scenario.

Results update

- Macroeconomic impacts were calculated in Q4 2021. Assumptions and results have not incorporated any 2022 developments in the macroeconomic environment or the energy markets.
- Data presented in the charts correspond to IPR Energy and Land Use countries/regions for each shock based on mapping with NIGEM's countries/regions coverage. Supporting excel files contain final IPR impacts for NIGEM's countries/regions coverage only.

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Key findings

Inflationary impacts

- Most economies see inflationary pressures compared to the baseline early in the transition for both FPS and RPS. Inflation is triggered primarily as the result of the introduction of carbon taxes in the economy. These inflationary pressures do not appear permanent given economies eventually decarbonise.
- For IPR we assumed a significant reduction of consumption of Fossil Fuels which leads to a gradual decline in Fossil Fuel prices over the forecast horizon. As a result, inflation could be subdued over the forecast period if higher projections for Fossil Fuels prices had been considered.
- There are also emerging arguments that point to medium term risks over inflation as a result of the transition to cleaner energies and disruption on the energy markets as a result of this shift . These arguments point to circumstances that could create permanent inflationary pressures during the transition including high demand of mineral used in renewable technologies coupled with limitation in the supply, readiness of technologies for full deployment over the next decade, and increasing governance pressure over FF investments that can push FF prices even higher.
- We considered these argument should be taken in consideration, and this reflect the inherent uncertainty of forecasting macroeconomic variables over long periods of time.
- Minerals, although more relevant now in greener technologies, may not be the single driver for renewable technologies deployment given these technologies are expected to evolve. Also, investors' disinvestments in Fossil Fuels could relocate capital to expand the supply of minerals for green technologies.
- We considered that shocks to the energy markets (specially for FF) will gradually reduce its impact as economies decarbonise. This may lead to less pressure from FF price fluctuation on consumer and producer prices.

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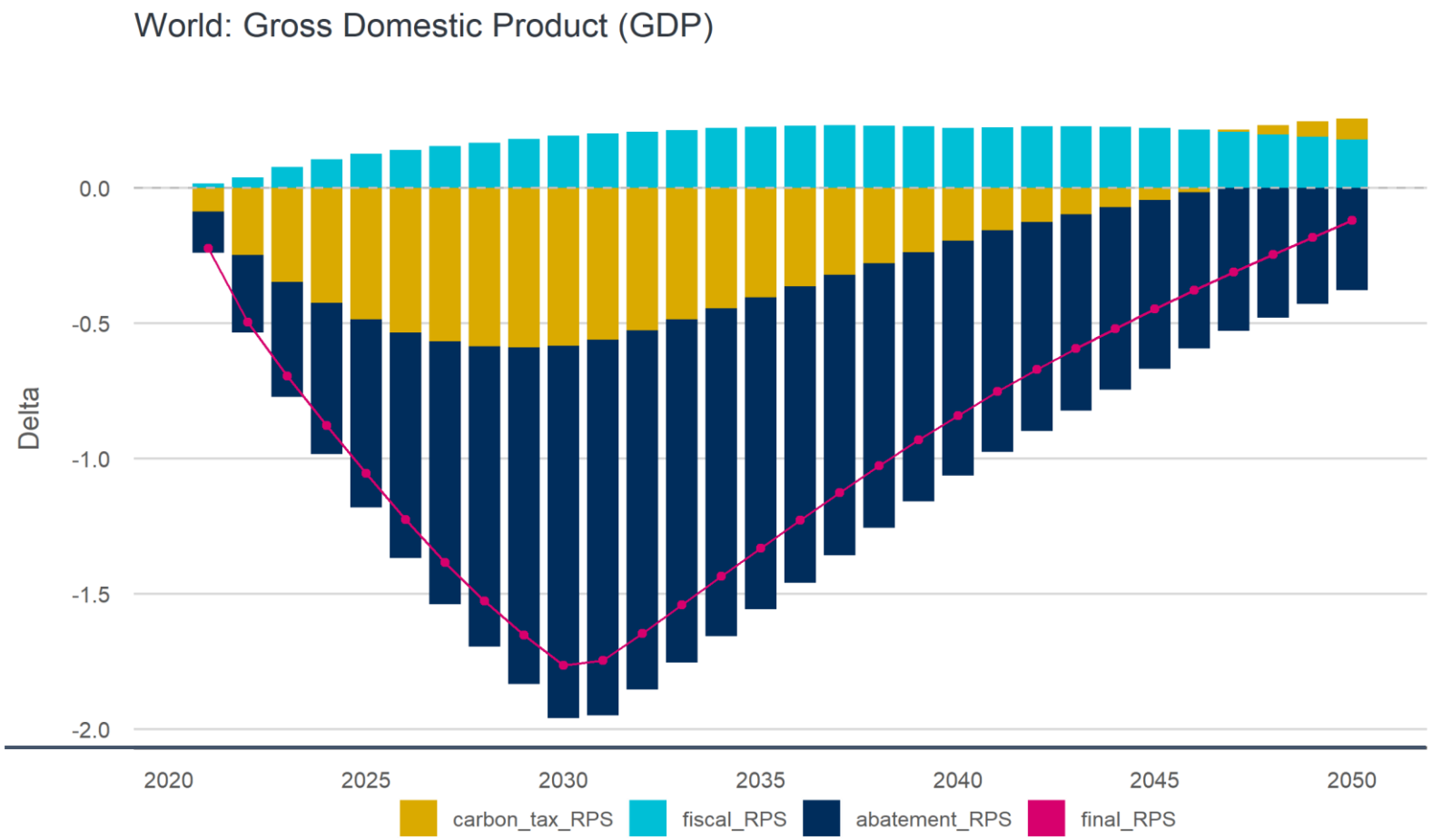
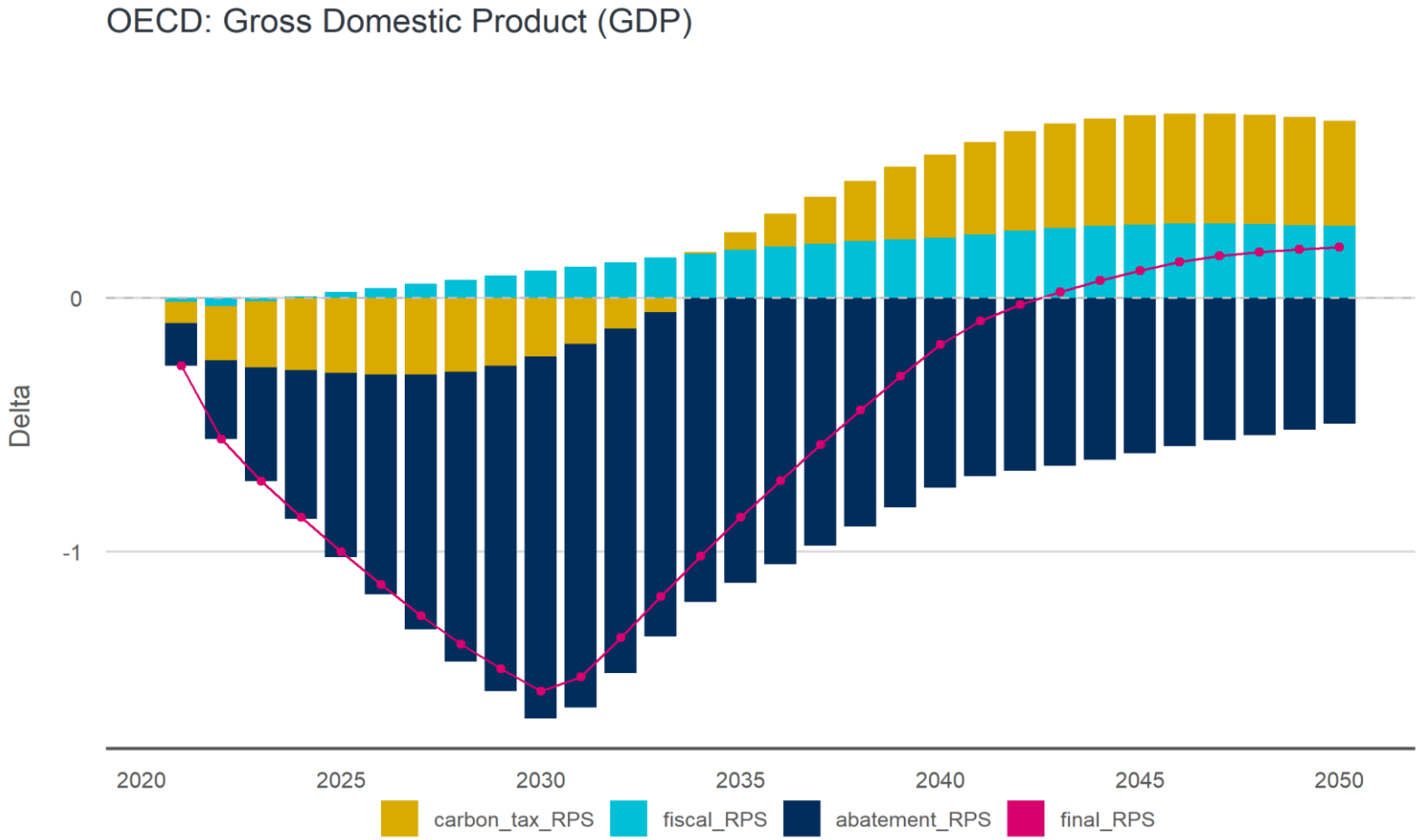
Real GDP cumulative transitional impacts: Global



- The majority of negative impacts are significantly mitigated by 2050 (see pink line in the left-hand side chart).
- In RPS a more ambitious policy scenario compared to FPS drives emissions down and frontloads the economic costs.
- RPS's transition will have negative impacts in the global economy by 2030 (pink line).
- This is partly offset by carbon revenue recycling back into the economy (through a combination of debt repayment, transfers, or government investments).

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: OECD



- OECD countries under RPS's see negative real GDP impacts before 2042.
- OECD's real GDP impact from the carbon tax shock is limited early in the scenario as a result of rapid decarbonisation. Lower FF prices boost real GDP later on the scenario through deflation.
- The boost from the fiscal shock in the economy is also moderate.
- OECD countries face large abatement costs compared to countries that decarbonise more gradually.
- Abatement costs are frontloaded compared to FPS.

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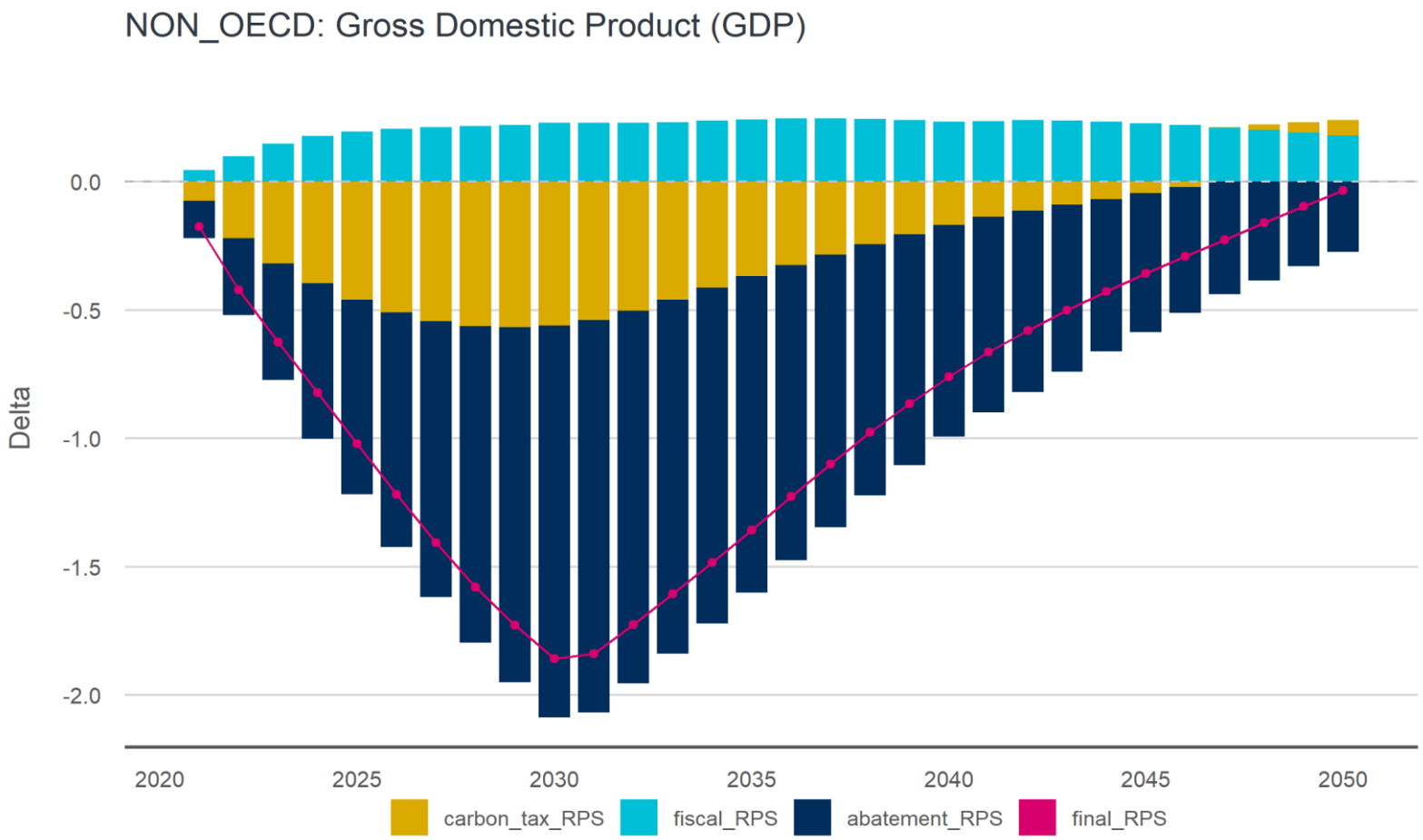
Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: Non-OECD



- Non-OECD countries see a -1.8% impact on real GDP, higher than FPS (-1.1%) by 2030. This is driven by large, frontloaded abatement costs in these economies.
- Heavy reliance on FF exports affect real GDP in these economies as the demand and prices of FF decline.
- Non-OECD countries face higher real GDP impacts from carbon taxes compared to OECD countries given these economies decarbonise more gradually.
- However, carbon tax impacts are less harmful compared to FPS as a result of higher policy ambition in RPS.

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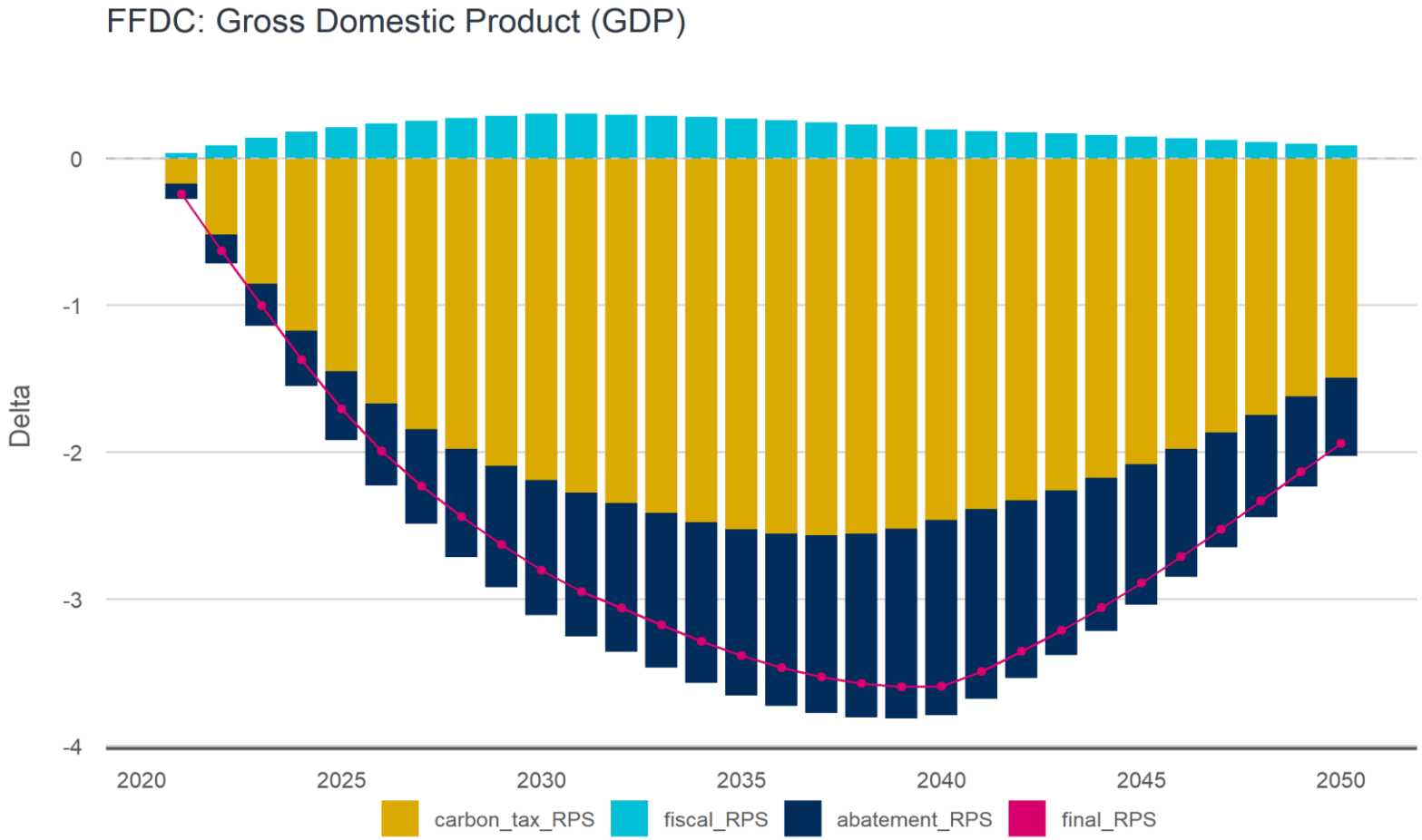
Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

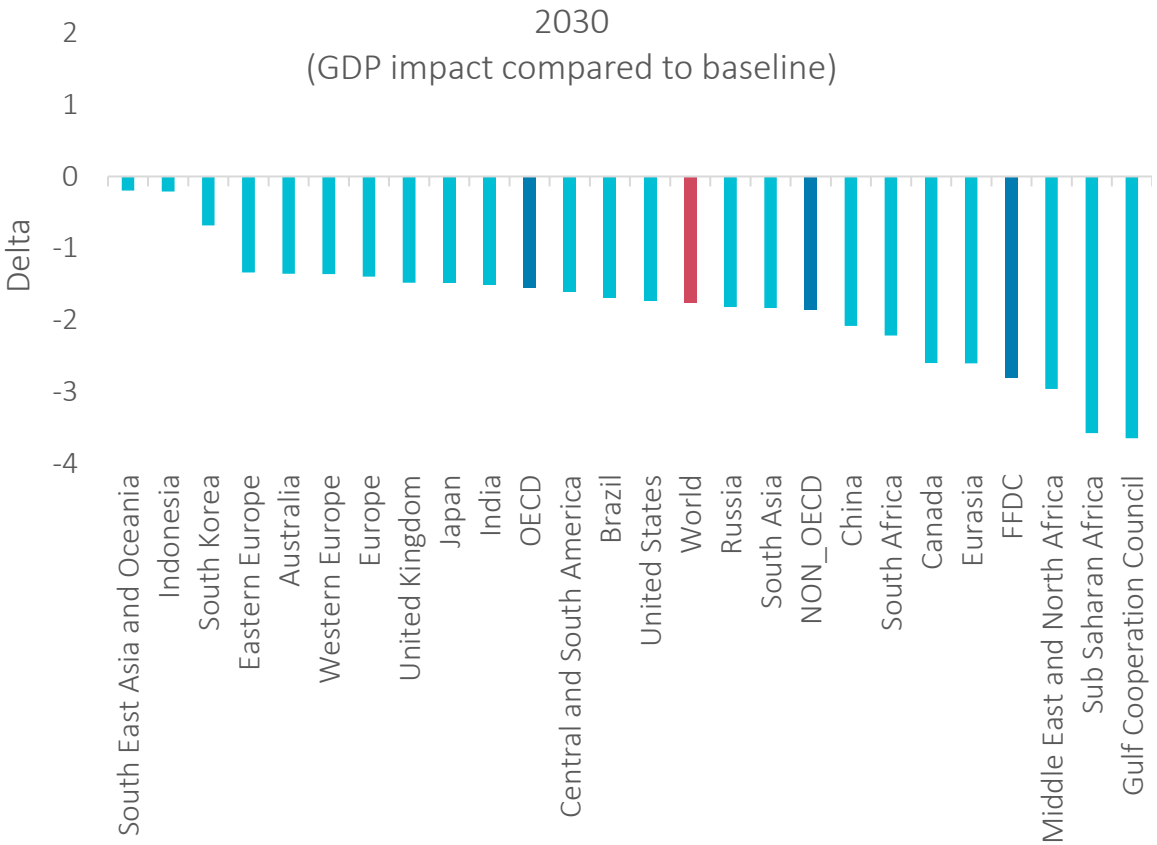
Real GDP cumulative transitional impacts: FFDC

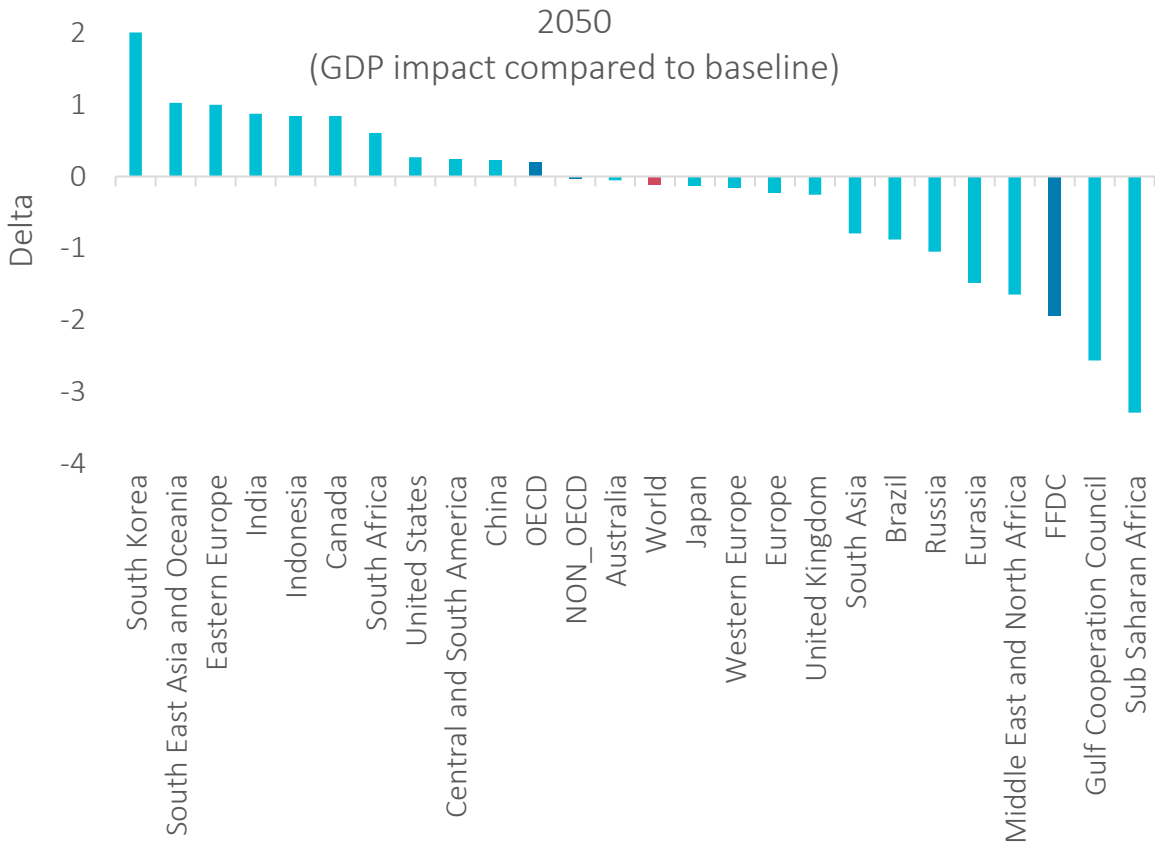


- FFDC countries see larger impacts under RPS compared to Non-OECD and OECD countries. Impacts are less severe when compared to the FPS impacts (2050), making the case for a more ambitious policy path for these countries/regions.
- Final RPS impact are driven primarily by carbon taxes. FFDC economies see these negative real GDP impacts over the forecast horizon as a result of short term inflationary pressure, coupled with a decrease in volume and price of FF exports.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

RPS final cumulative transitional impacts on real GDP by 2030 and 2050 by country (across all shocks)





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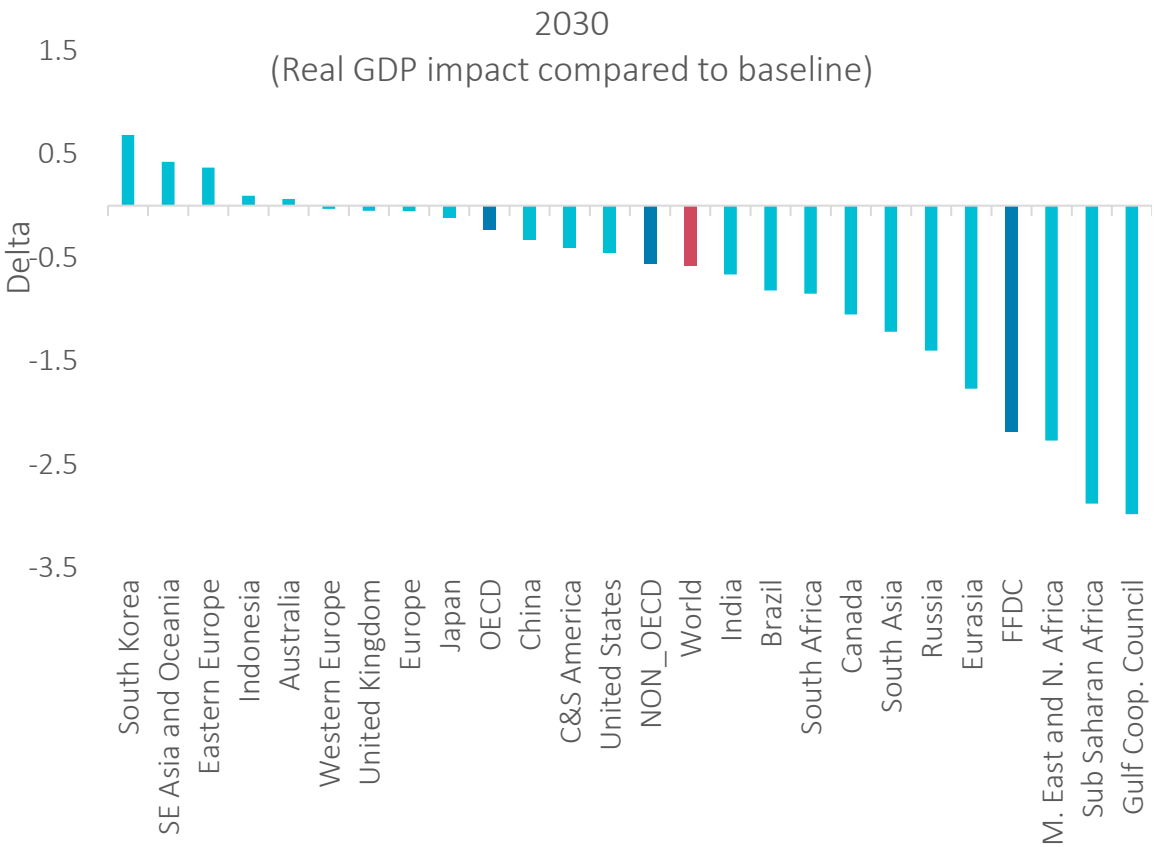
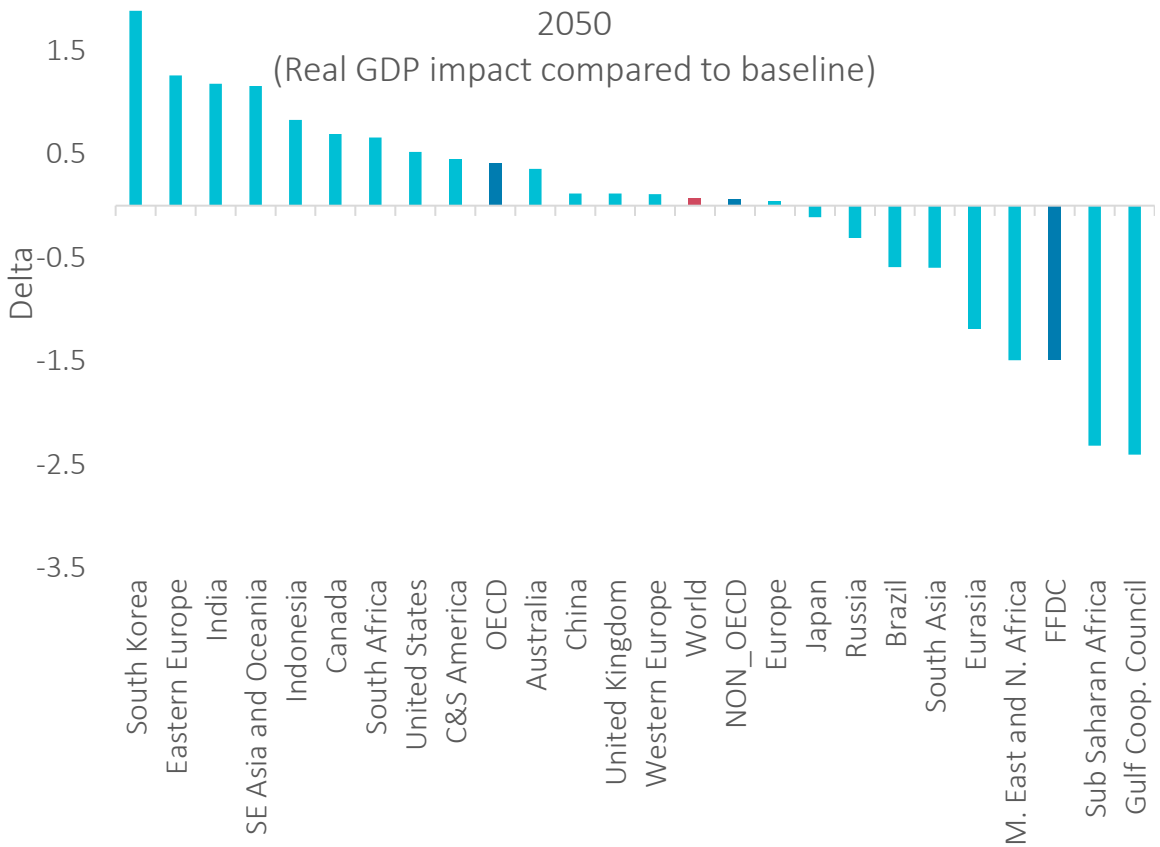
Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.

Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (1/3): RPS carbon tax impacts on real GDP



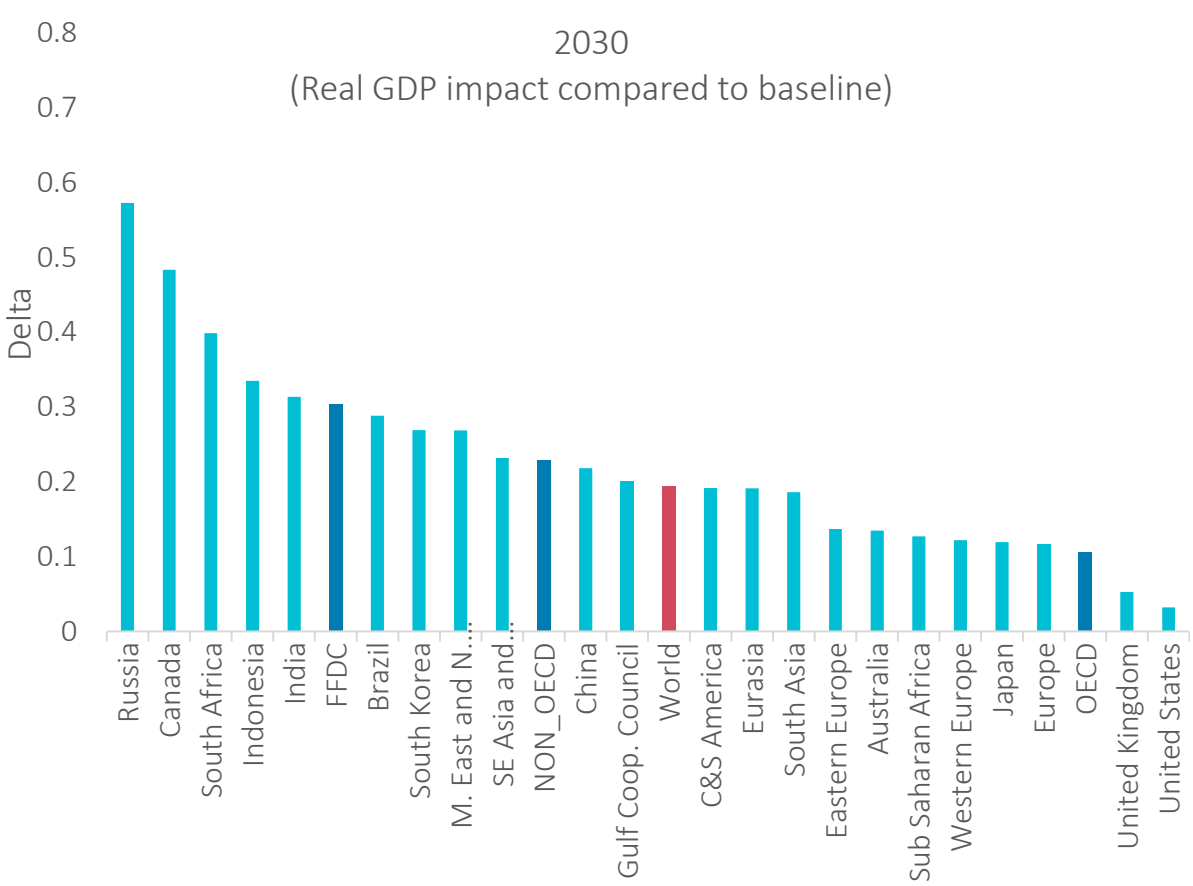


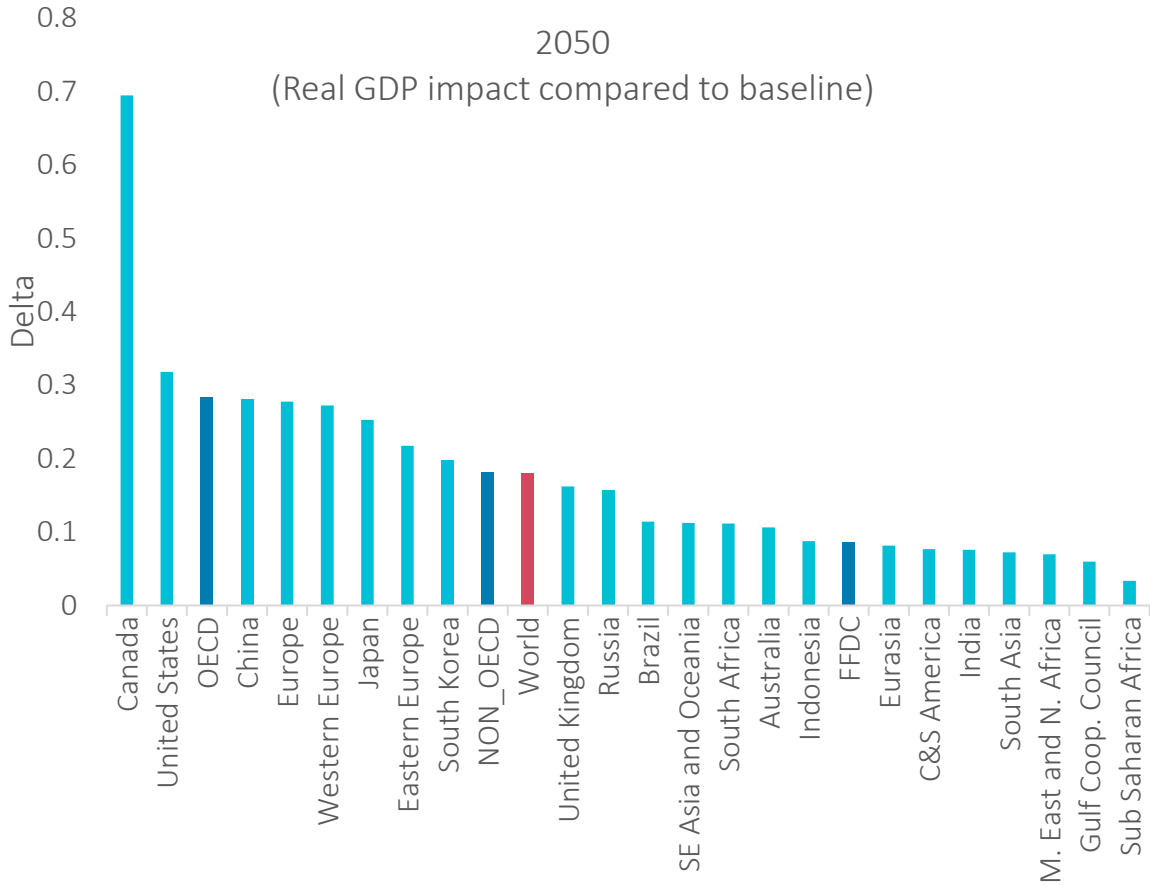
INEVITABLE POLICY RESPONSE

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.

Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (2/3): RPS fiscal impacts on real GDP



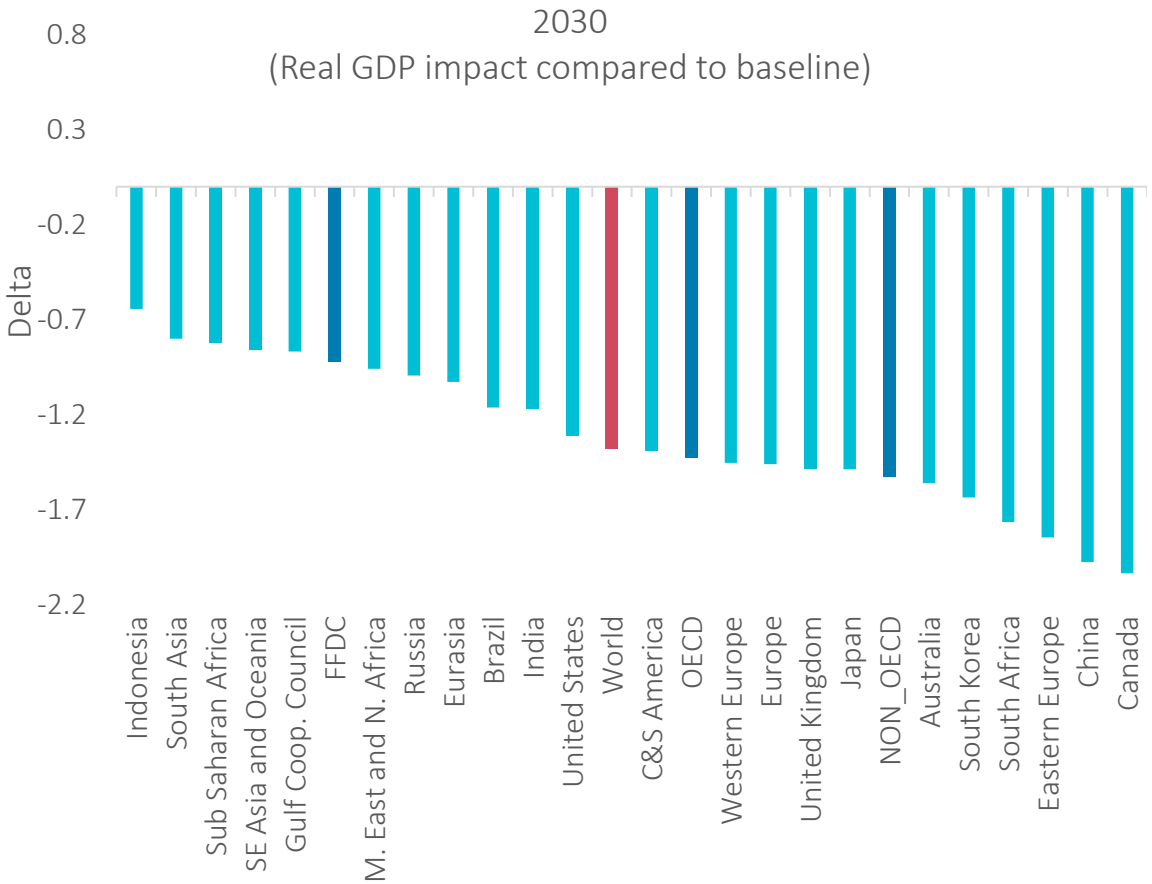


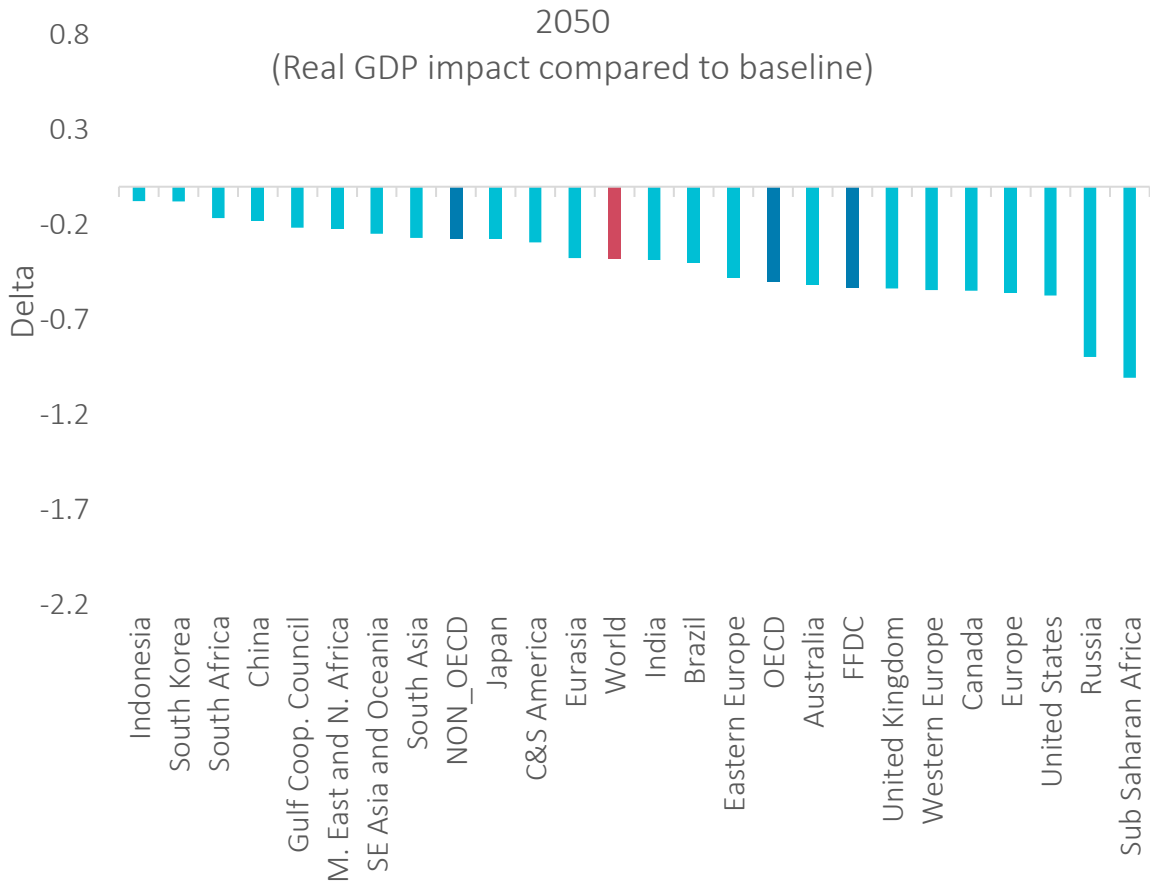
INEVITABLE POLICY RESPONSE

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.

Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (3/3): RPS abatement impacts on real GDP





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Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.

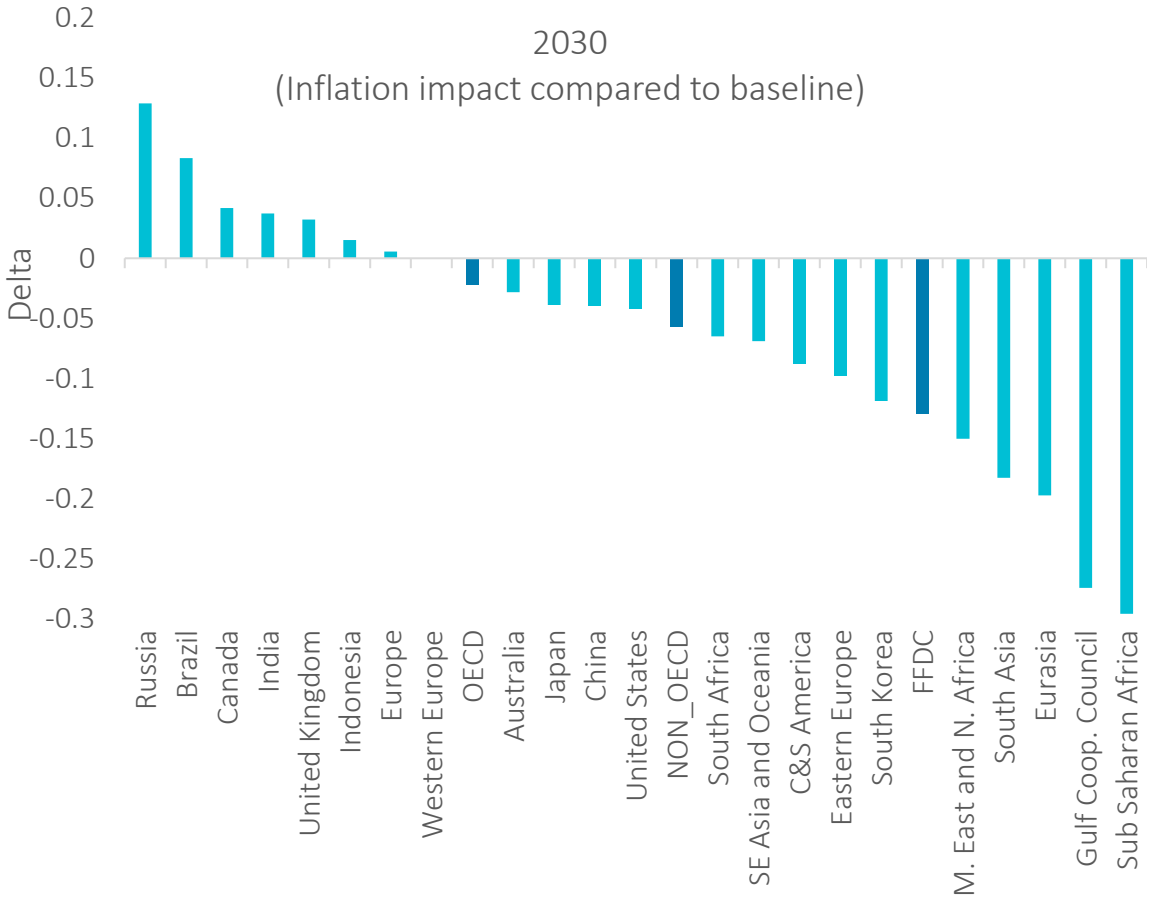
Source: NIGEM based on Vivid Economics inputs.

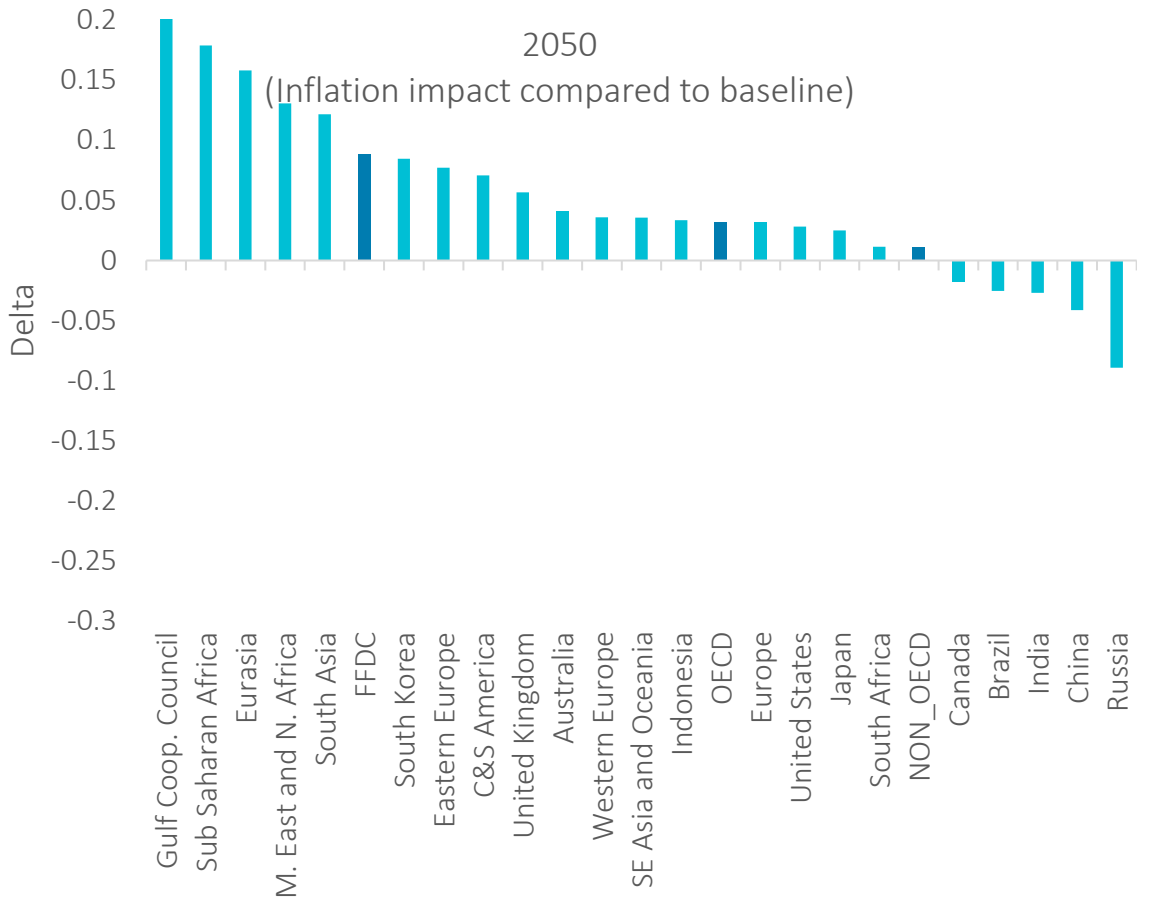
RPS final transitional cumulative impacts on inflation by 2030 and 2050 by country (across all shocks)

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.

Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (1/3): RPS carbon tax impacts on inflation





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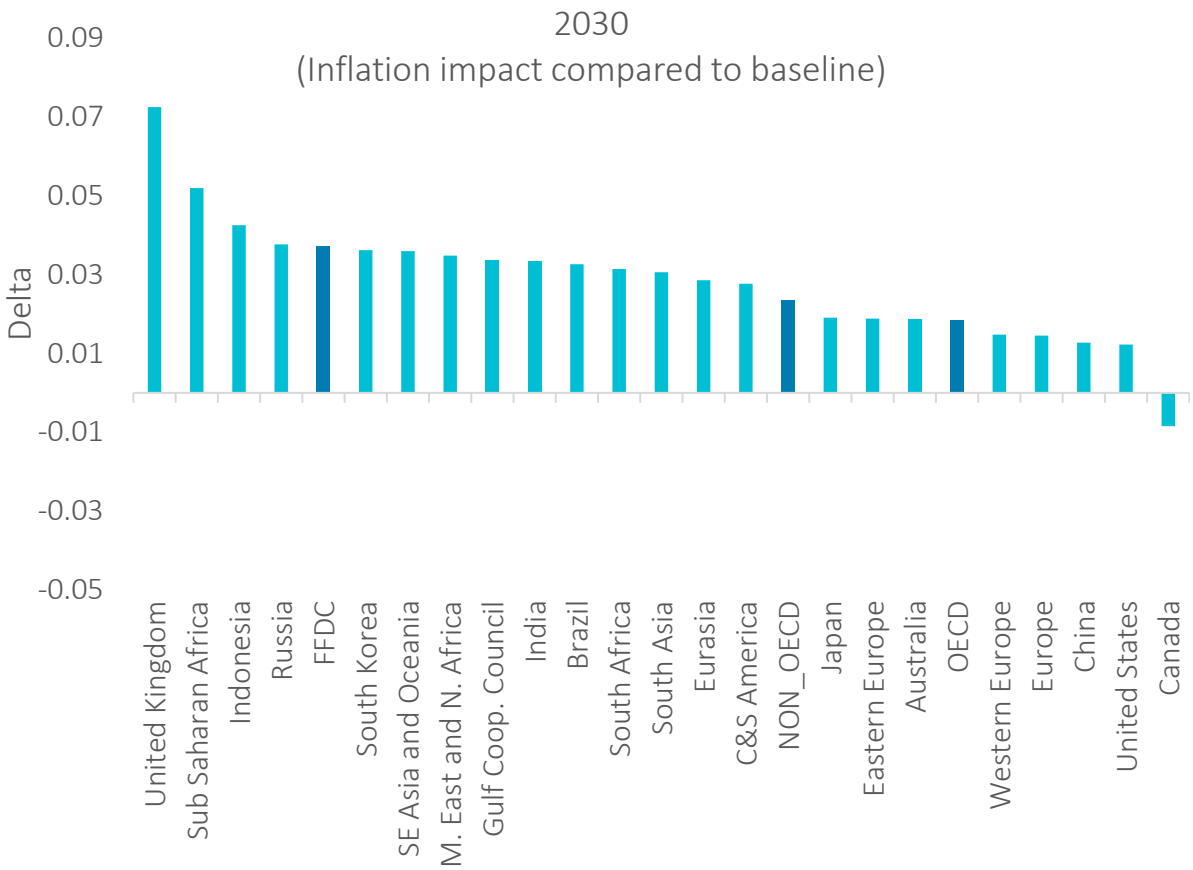
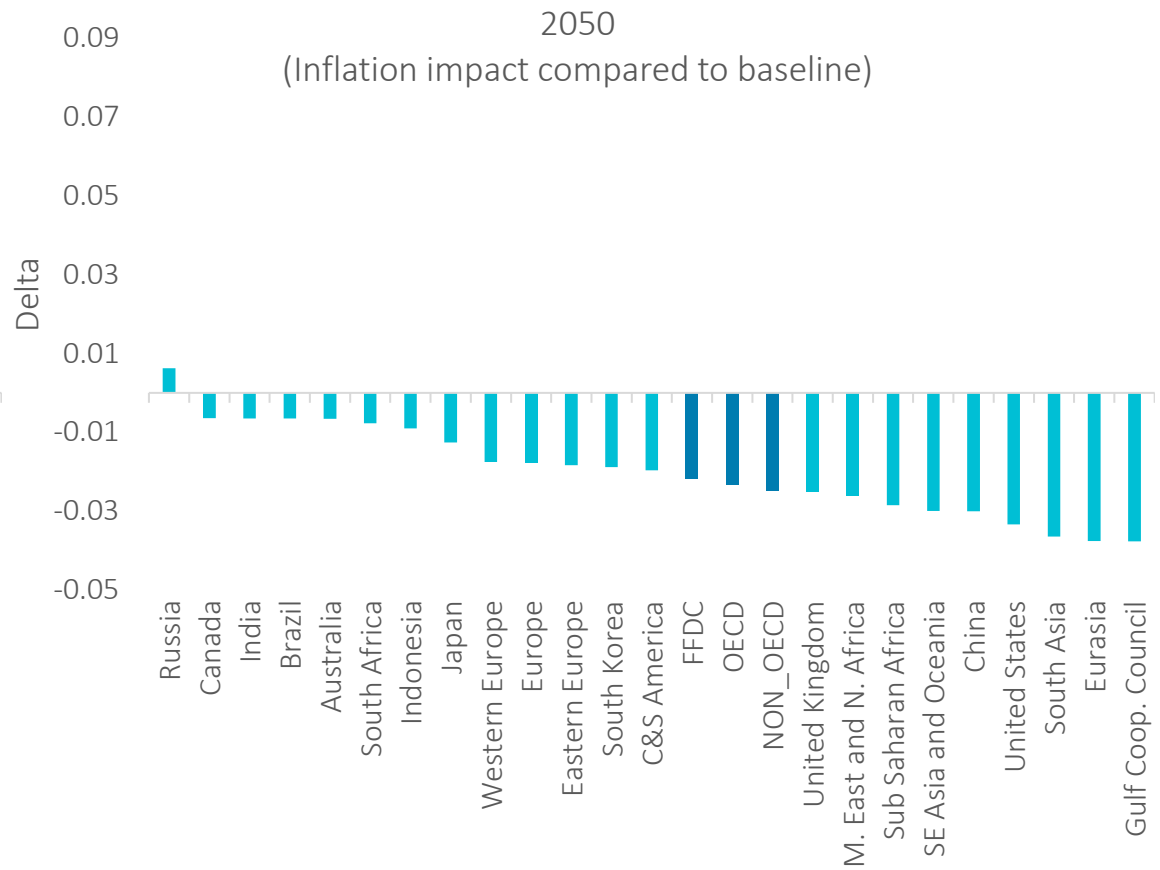
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (2/3): RPS fiscal impacts on inflation





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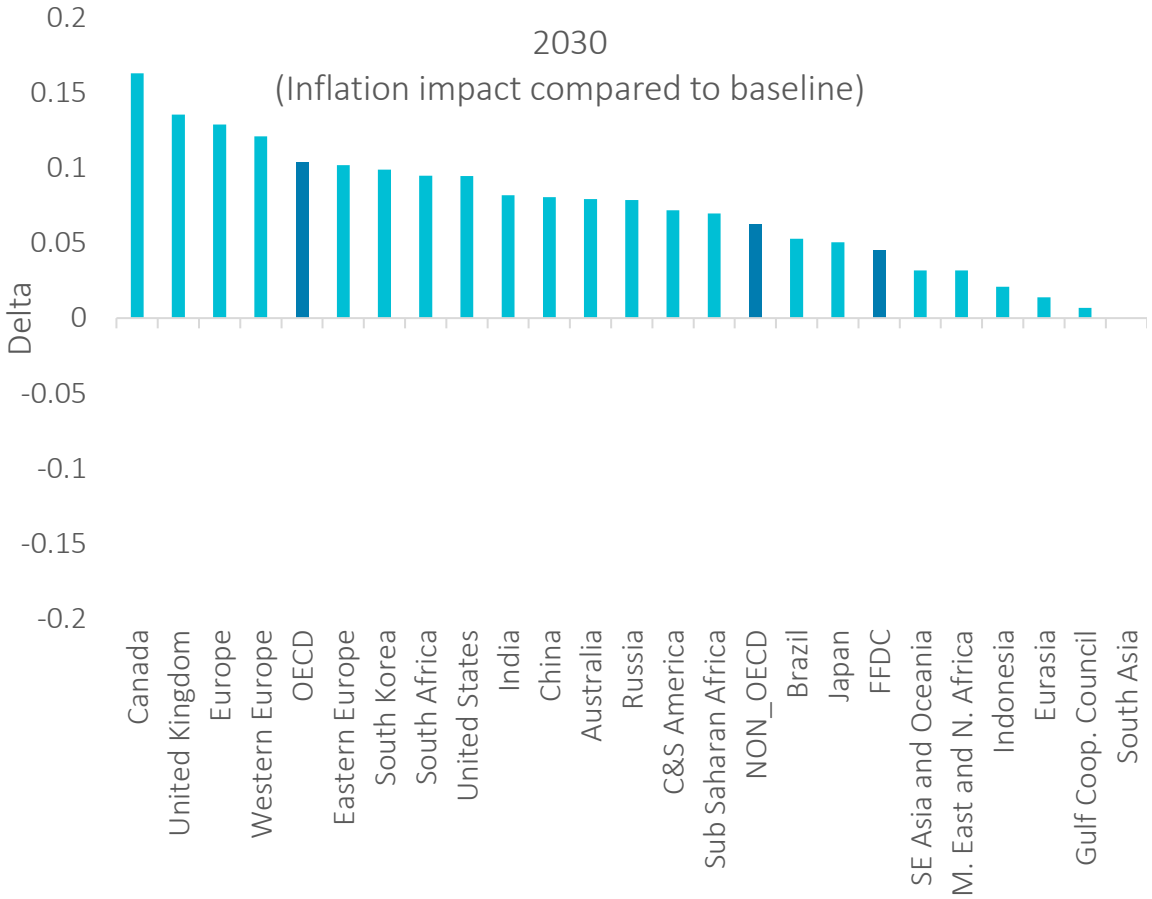
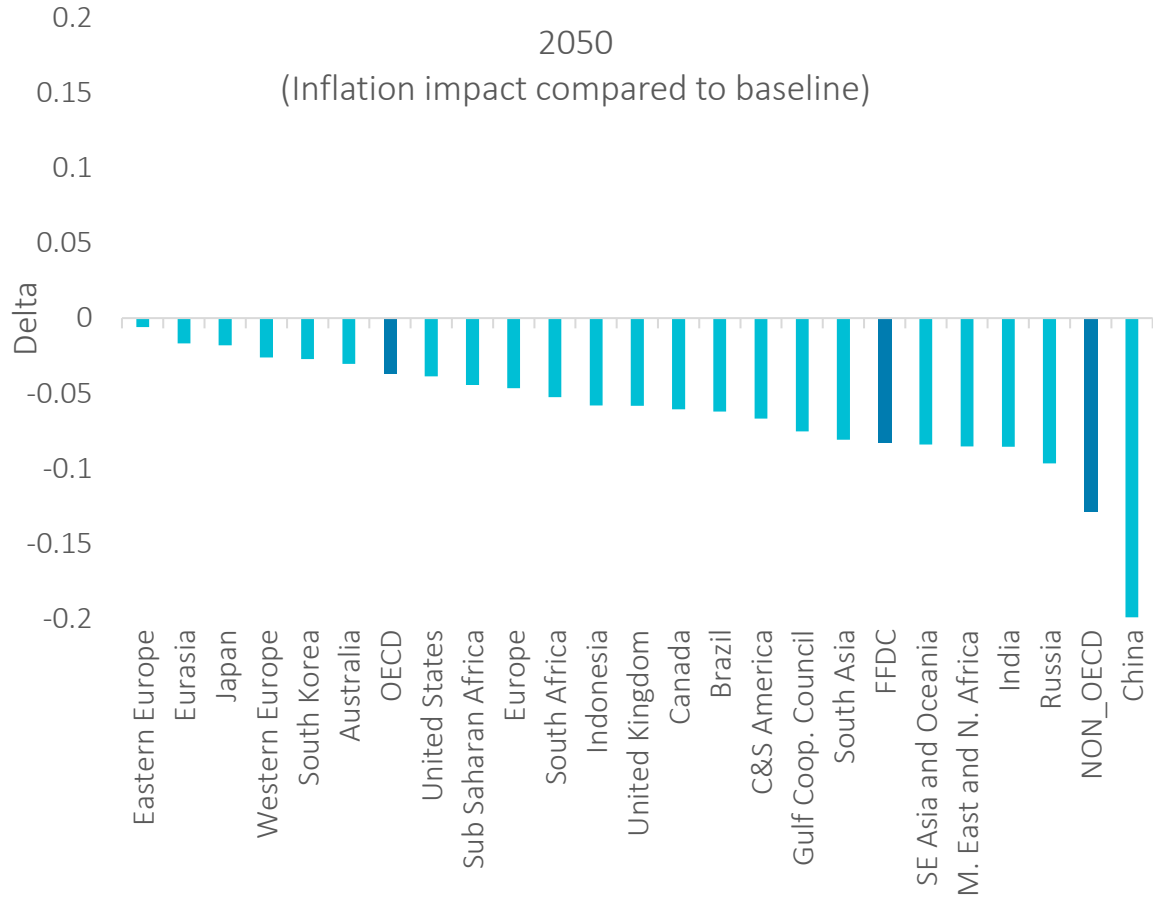
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Sub-component of final cumulative transitional impact (3/3): RPS abatement impacts on inflation





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Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.

Source: NIGEM based on Vivid Economics inputs.

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Real GDP

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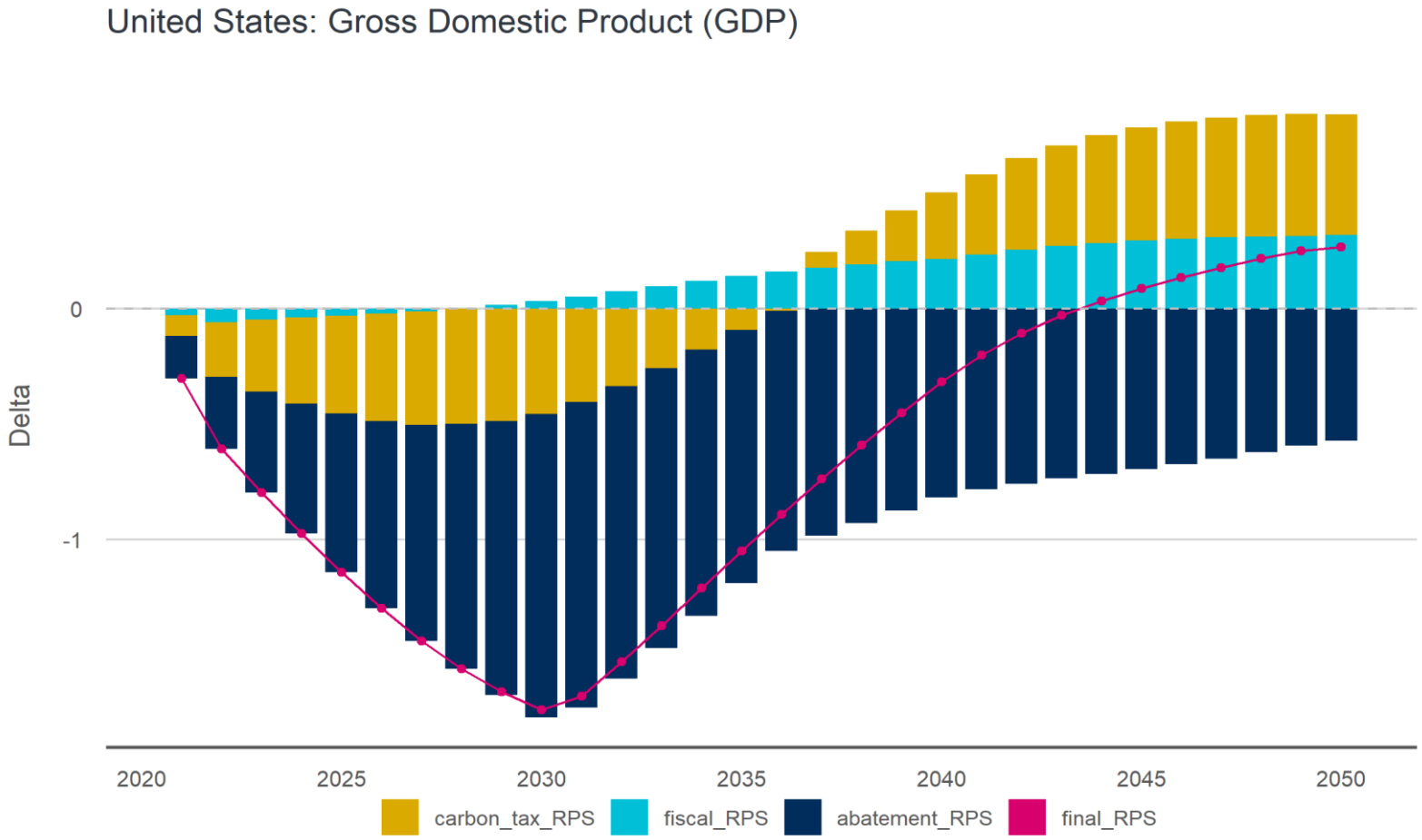
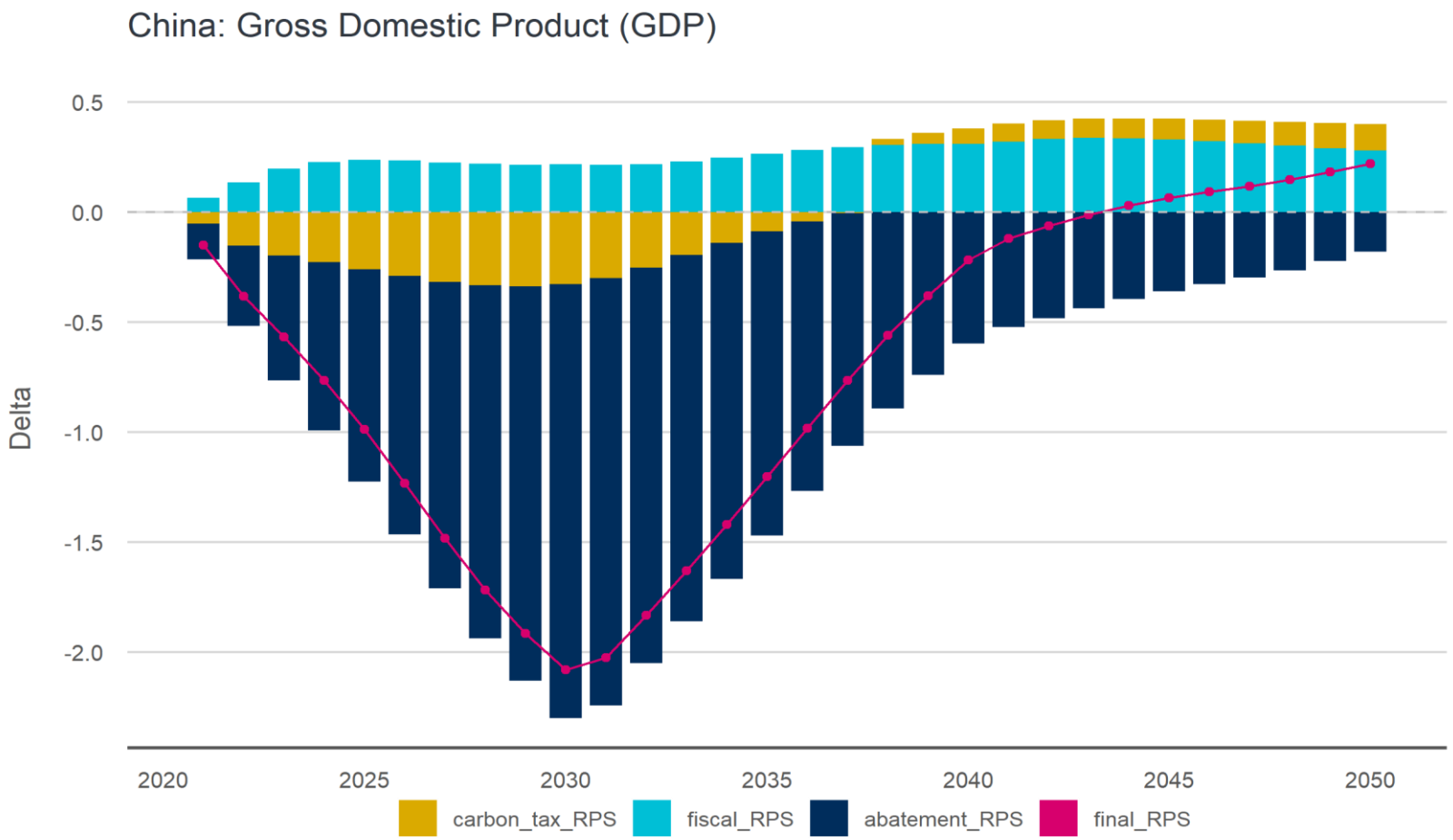
Real GDP cumulative transitional impacts: United States



- The RPS transition is expected to hit the US economy the most by early 2030s, with real GDP decreasing by -1.7% vs. the baseline in 2030. Negative impacts dissipate by 2044.
- Abatement costs drive most of the impacts in RPS.
- Carbon taxes impacts are relatively limited in the first two decades of the transition given the rapid decarbonisation. As FF prices decline, these drives inflation down with positive impact GDP.
- As a result, the fiscal impact of carbon revenue recycling is rather limited.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: China



- Climate change transition is expected to hit the Chinese economy the most by early 2030 but by 2043 the transition is neutral.
- Final real GDP cumulative impacts are driven mostly by abatement costs in the first decade of the transition as a result of the rapid decarbonisation.
- The carbon tax shock is expected to hit US and Chinese economies in a similar magnitude. Whilst the US sees higher carbon prices compared to China, the US implements an aggressive decarbonisation policy which in the case of China is more gradual.

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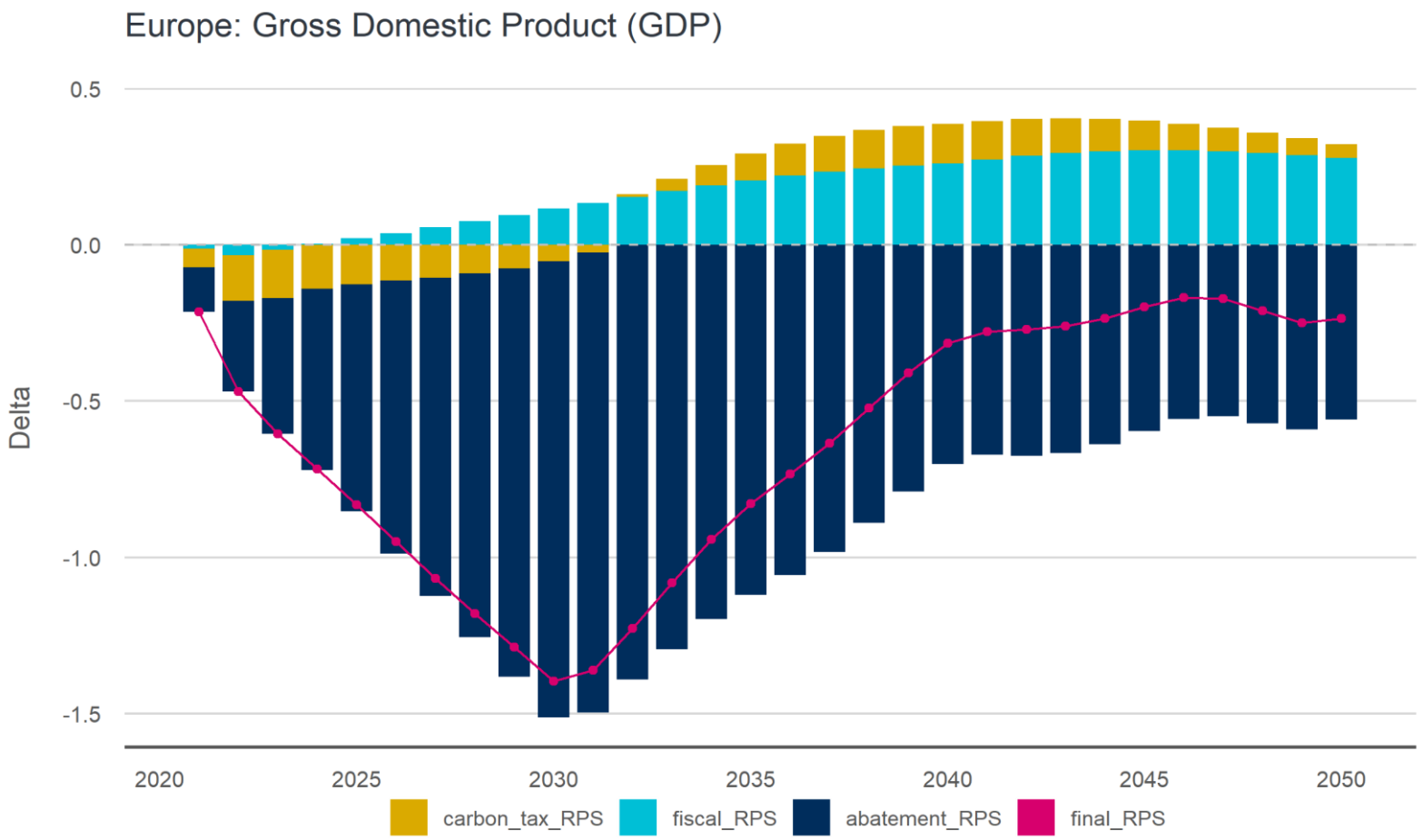
Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

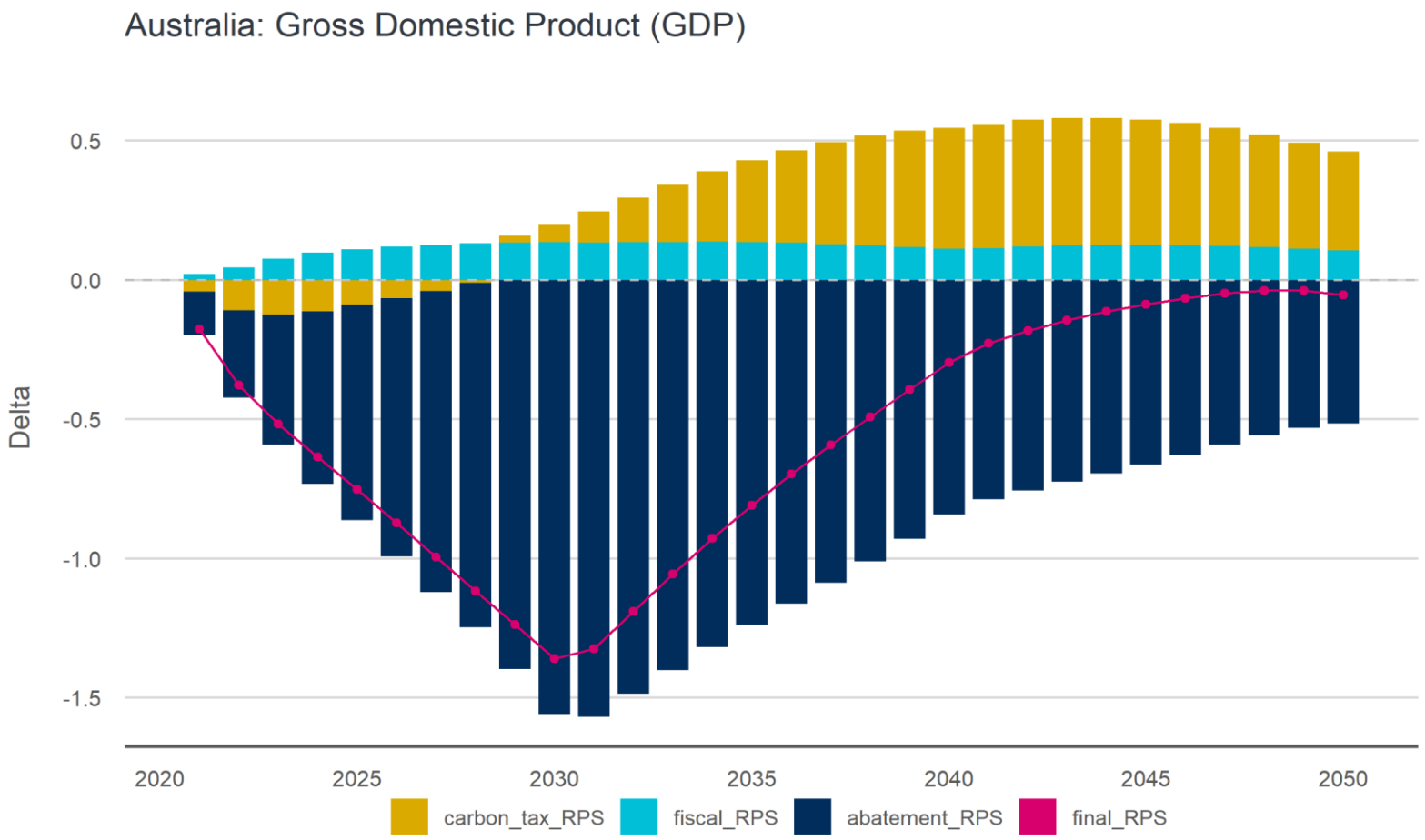
Real GDP cumulative transitional impacts: Europe



- Europe will see a milder impact from the RPS relative to the US and China by 2030. Similarly to the US and China, most real GDP negative impacts dissipate by mid 2040's.
- Abatement costs are not far from the world average.
- Given the rapid decarbonisation of the EU economy, real GDP impacts from carbon taxes are limited. Positive impact on GDP comes from lower FF prices in the scenario.
- Revenue recycling can partially offset the negative impacts given carbon prices increase more rapidly than in other economies.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

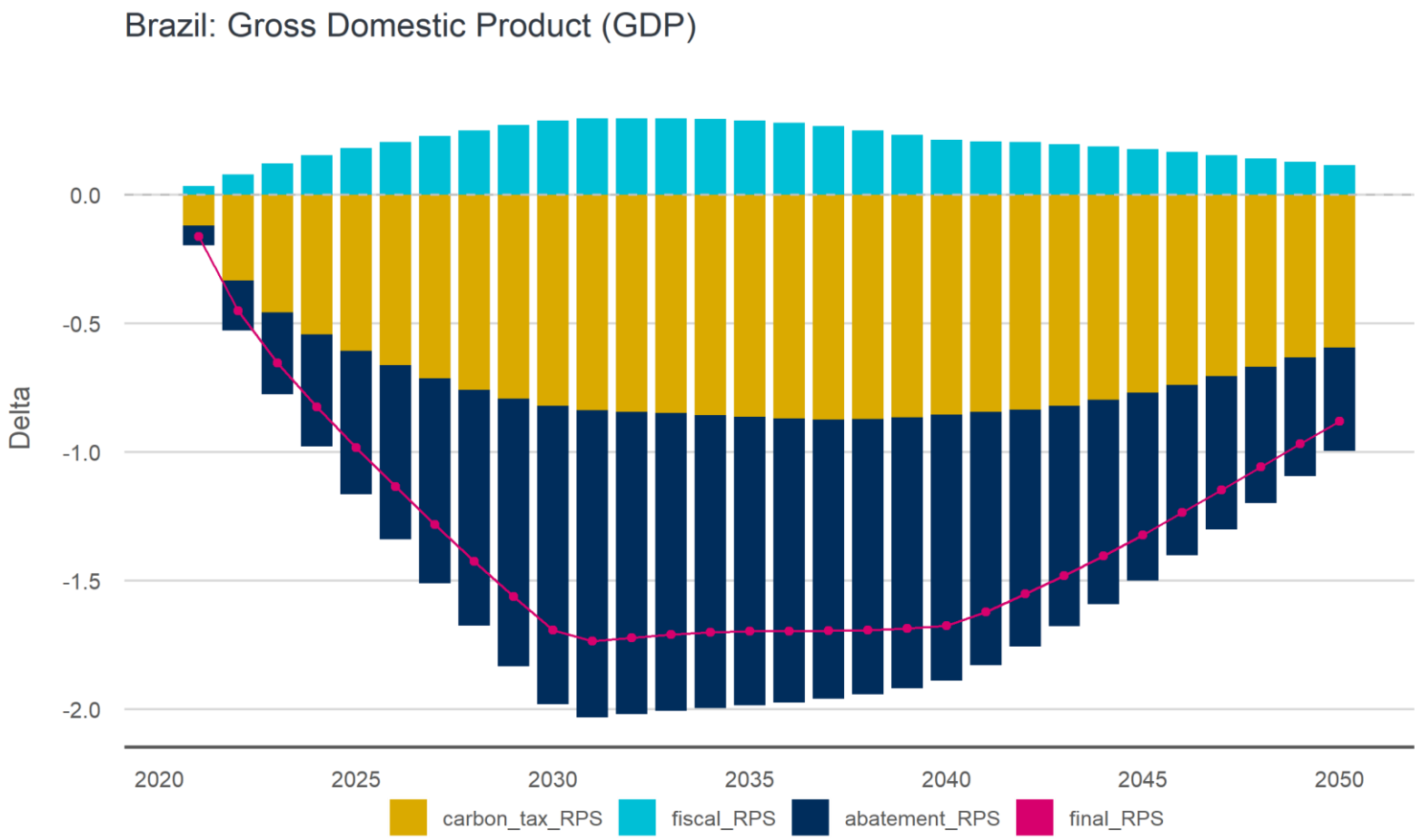
Real GDP cumulative transitional impacts: Australia



- RPS is expected to hit Australian economy the most by early 2030s (-1.4% vs baseline).
- Australia sees similar carbon tax impact to the one in Europe in the short term. Long term, Australia benefits from lower FF prices, which sees inflation decline compared to baseline and making a positive impact on GDP.
- Such positive impact is counteracted by abatement costs paid during the same period.
- Abatement costs are similar to other OECD economies.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

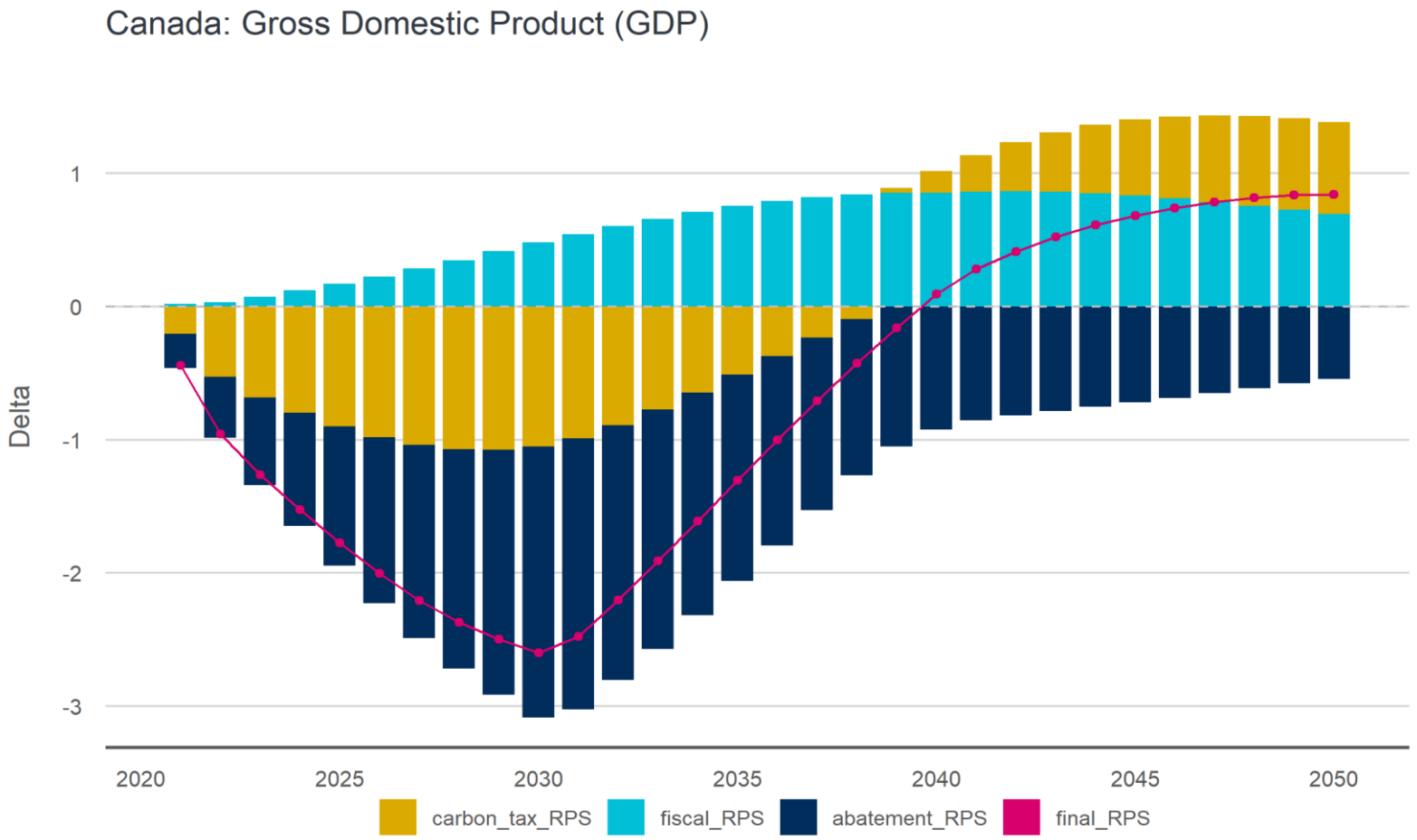
Real GDP cumulative transitional impacts: Brazil



- RPS is expected to hit the Brazilian economy the most by 2030, with real GDP decreasing by -1.7% vs the baseline.
- A decrease in the demand for FF has a significant impact on Brazil's FF exports (through volume and prices). This is reflected in the carbon tax shock.
- The fiscal shock partly offsets the carbon tax and abatement impacts, given Brazil's decarbonisation only speeds up after 2030.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: Canada



- RPS is expected to hit Canadian economy the most by early 2030s, with real GDP decreasing by -2.6% vs. the baseline.
- Canada decarbonise their economy faster and raise carbon prices more rapidly to accelerate the transition. This has a significant impact on GDP early on the scenario.
- As FF prices decline, this reduces any inflationary pressures and boost real GDP later on the scenario.
- Abatement costs in Canada (% GDP) by 2030 are the highest across all regions/countries.

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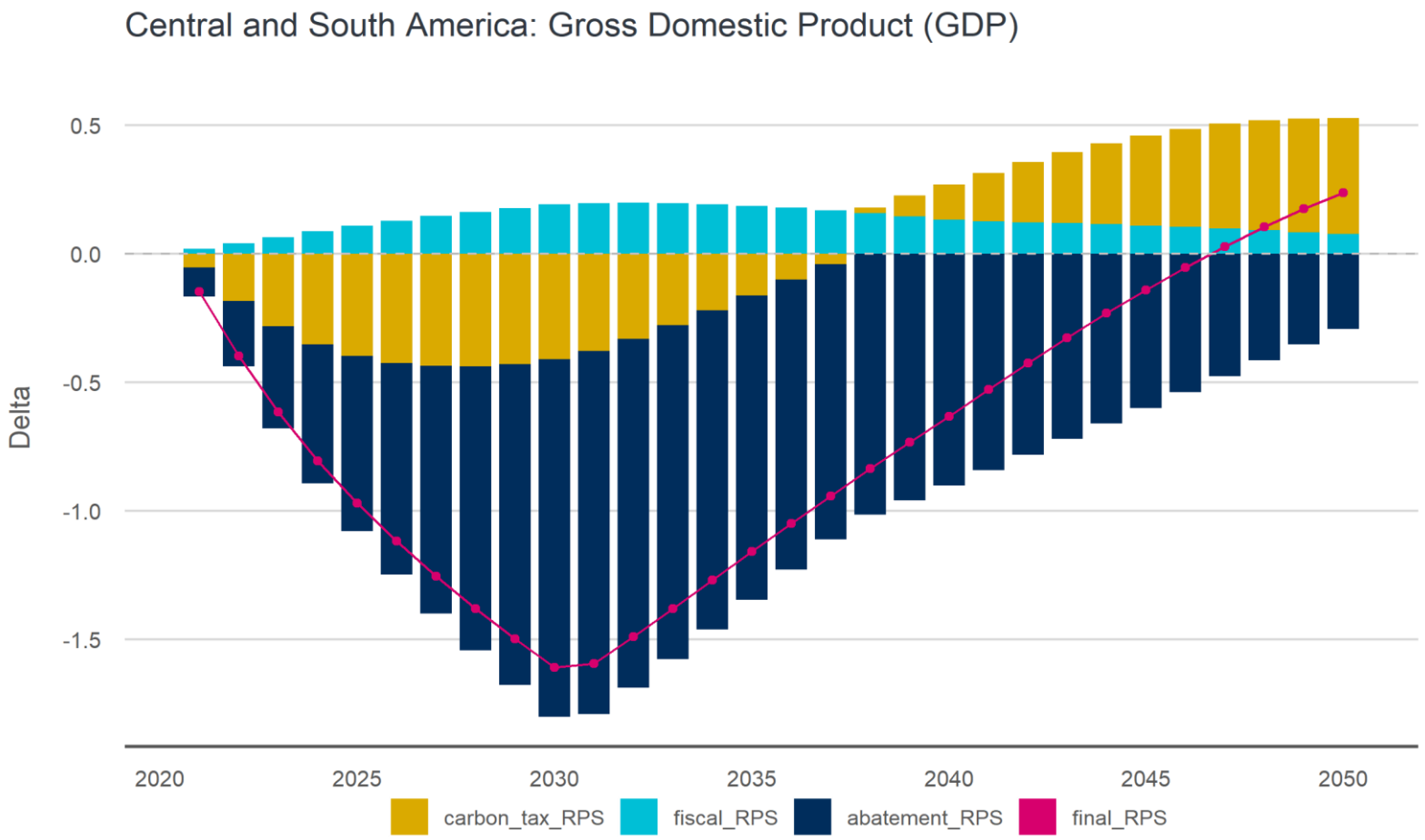
Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

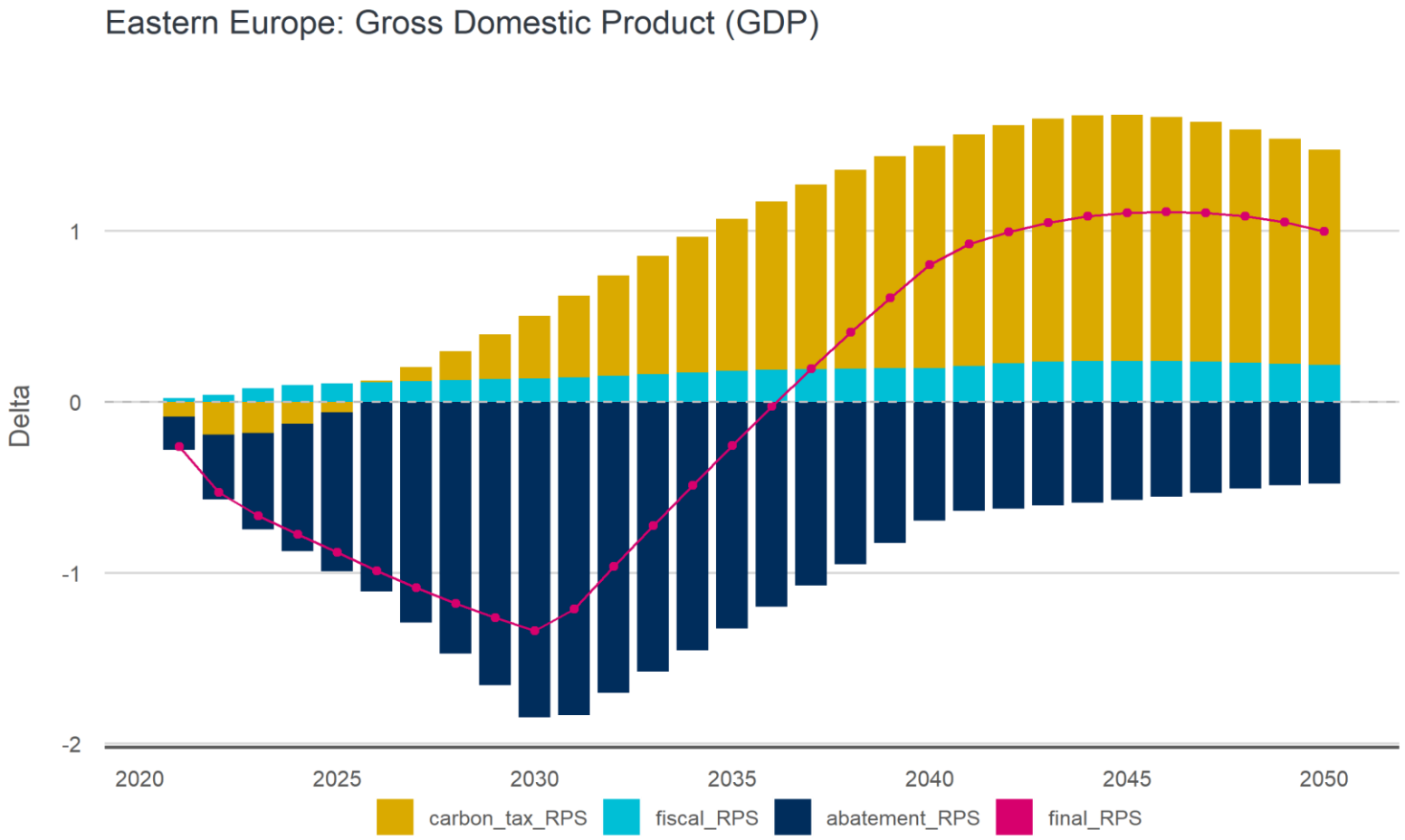
Real GDP cumulative transitional impacts: Central and South America



- Central and South America (CSA) sees most of negative impacts fade by 2050 in RPS. However, the impact is -1.4% by 2030.
- Similar to Brazil, CSA suffers from a decrease in FF exports, with relatively mild inflationary pressures from Carbon taxes early in the scenario. Carbon taxes increase more gradually compared to Brazil.
- Abatement costs are close to the slightly above average compared to other developing economies by 2030.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

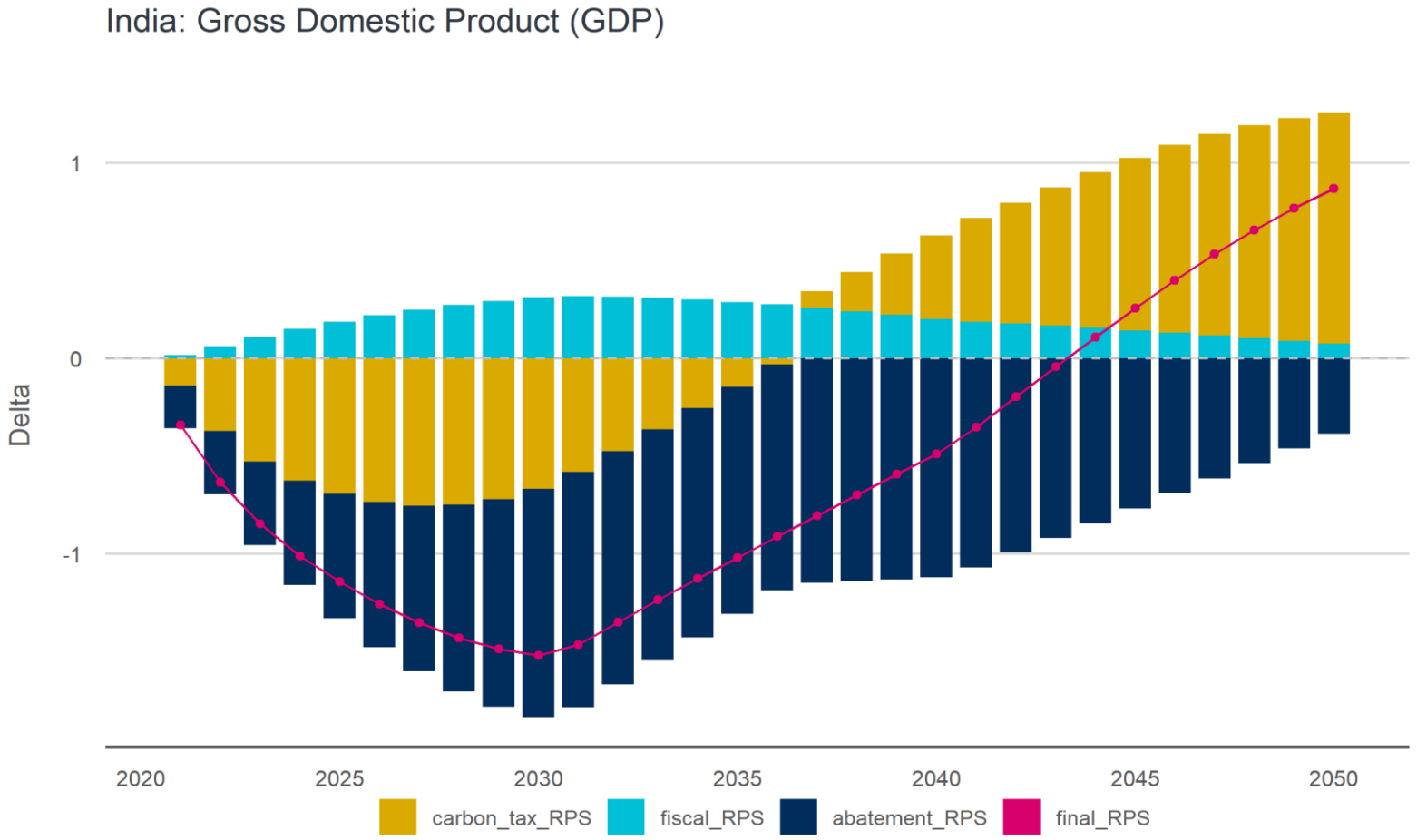
Real GDP cumulative transitional impacts: Eastern Europe



- RPS is expected to hit Eastern European economies the most by early 2030s, with real GDP being -1.4% lower vs. the baseline.
- EE countries see positive carbon taxes impacts by 2027 as a result of deflationary pressures due to declining FF prices. That leaves room for an expansionary policy rate that boosts real GDP. Trade also contributes positively to the economy after 2030.
- This is partially counteracted by abatement costs, which are slightly above average of other countries by 2030.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

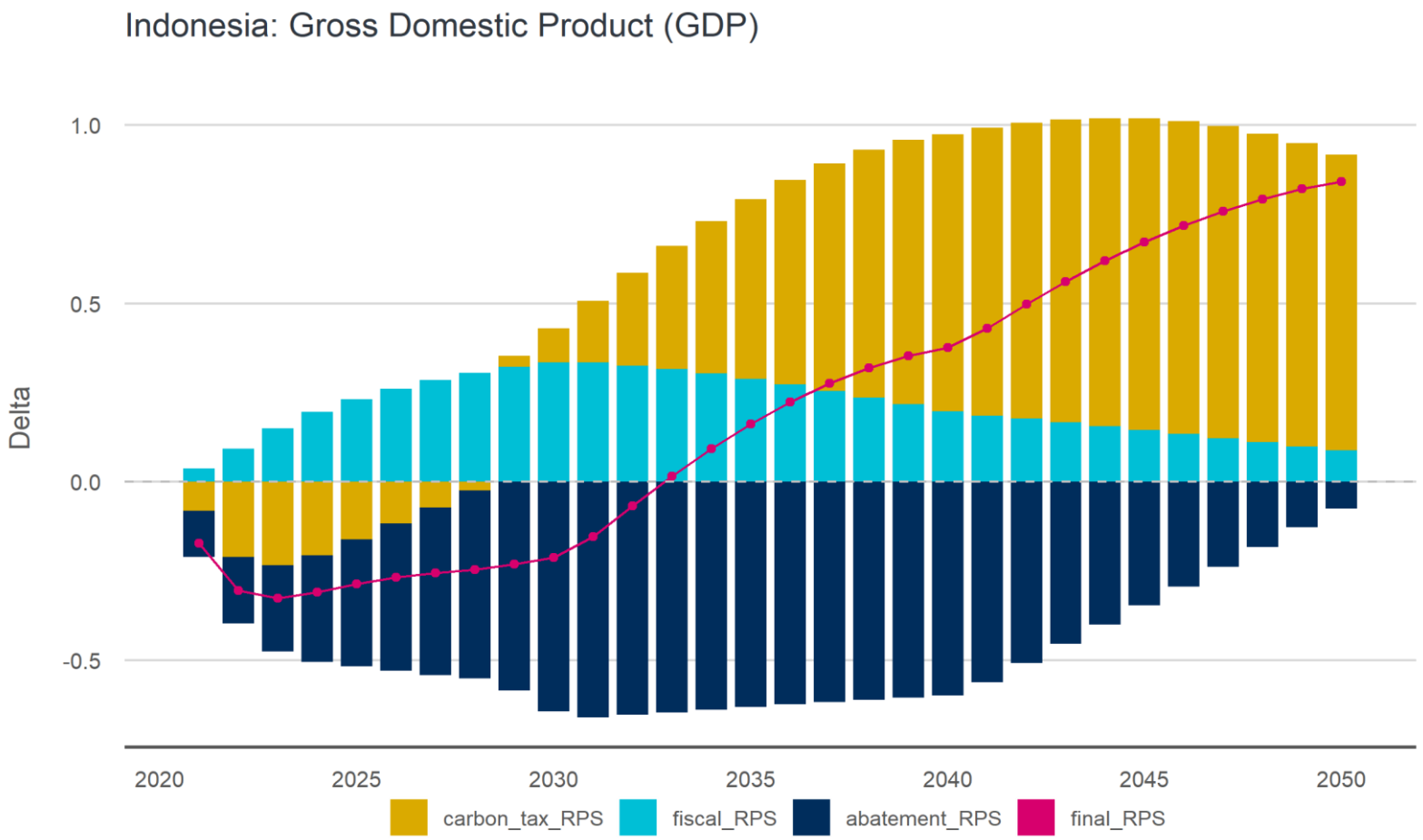
Real GDP cumulative transitional impacts: India



- India sees a positive impact from RPS by 2050 (close to 0.5%). The impact is -1.27% by 2030.
- India's carbon tax has a negative impact early in the scenario under RPS given emission reductions happening at that point compared to FPS.
- RPS abatement costs are front loaded compared to the FPS . This is in line with the results of other economies.
- FF price decline provides a relief later in the scenario (India is not a FF exporter) but this is counteracted by abatement costs that pay for the transition.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: Indonesia

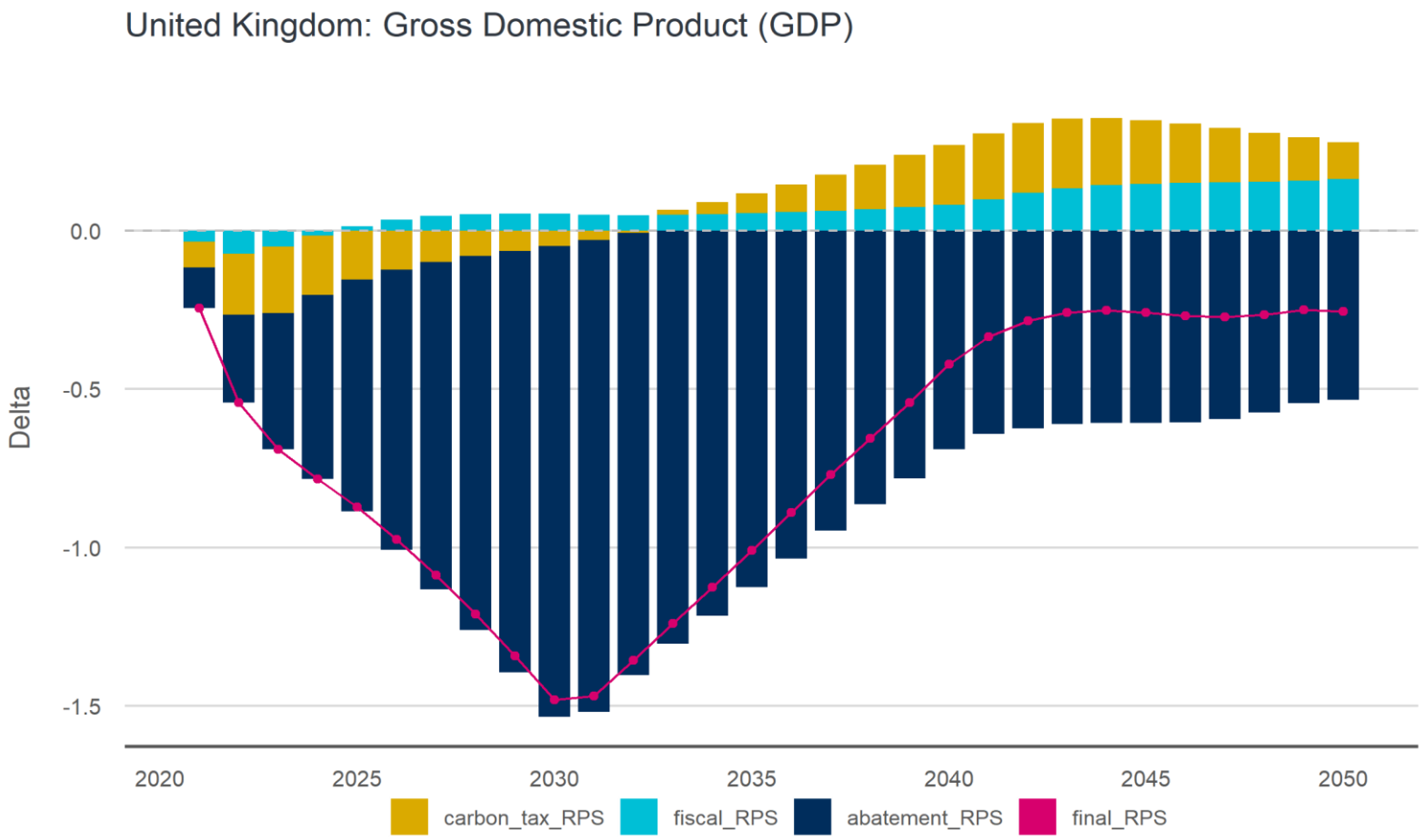


- RPS is expected to have a positive impact in the Indonesian economy by 2050.
- The carbon tax has a lower impact compared to most economies as a result of low carbon prices (despite slow decarbonisation).
- Given inflationary pressures are low (as a result of low impact of carbon taxes), monetary policy gives a boost to real GDP by not increasing rates after 2035. Trade also contributes positively to the economy in the second half of the scenario.
- Abatement costs are among the lowest across economies.

INEVITABLE POLICY RESPONSE

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

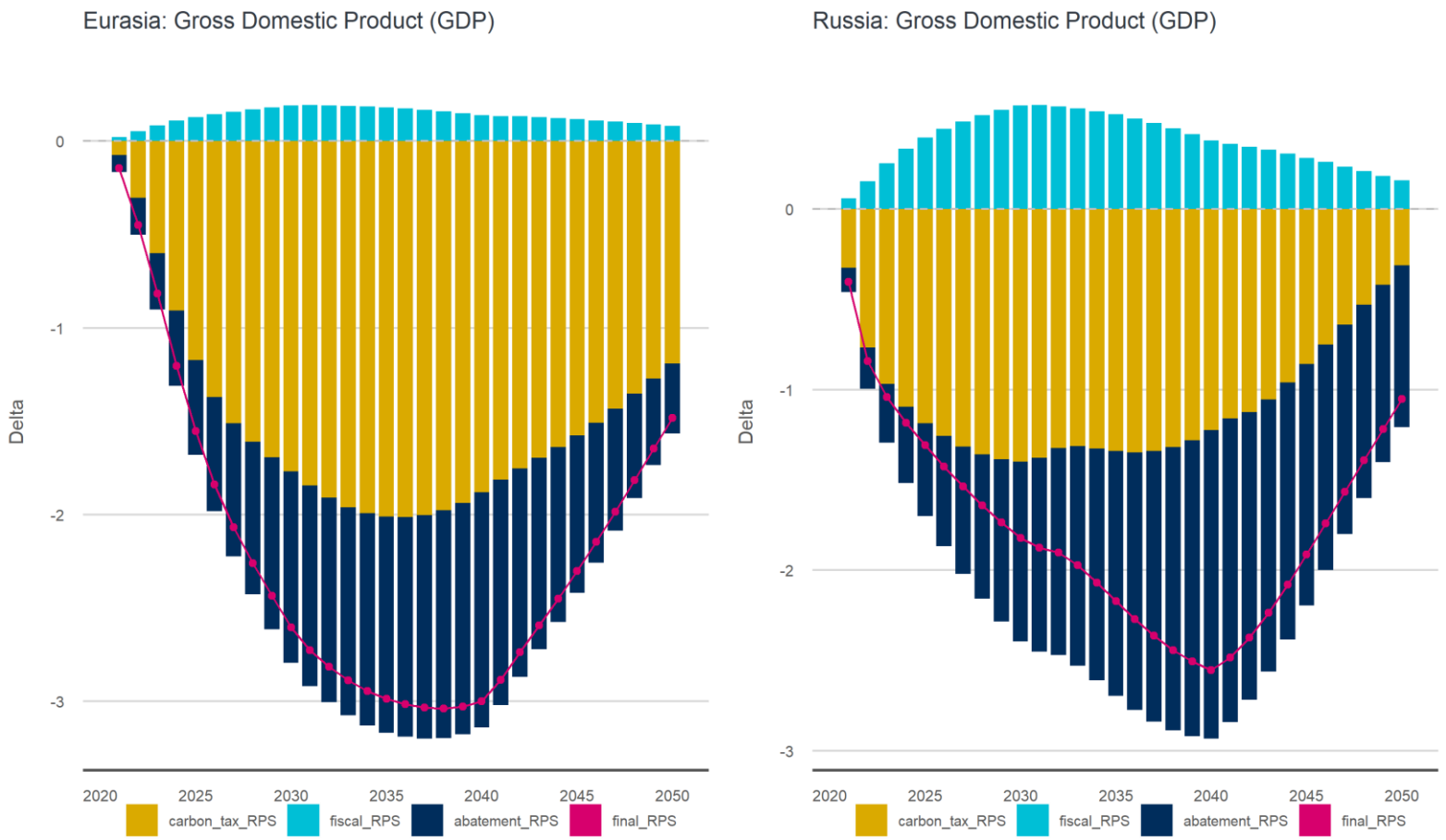
Real GDP cumulative transitional impacts: United Kingdom



- The UK sees a negative impact of -1.5% by 2050 in its economy from RPS compared to baseline.
- The UK economy sees a similar impact from carbon taxes compared to Europe.
- Fiscal impact is slightly more muted than in Europe as a result of a more gradual reduction in emissions compared with Europe (carbon prices are identical).
- Abatement costs by 2030 are slightly higher in the UK compared to other European economies.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

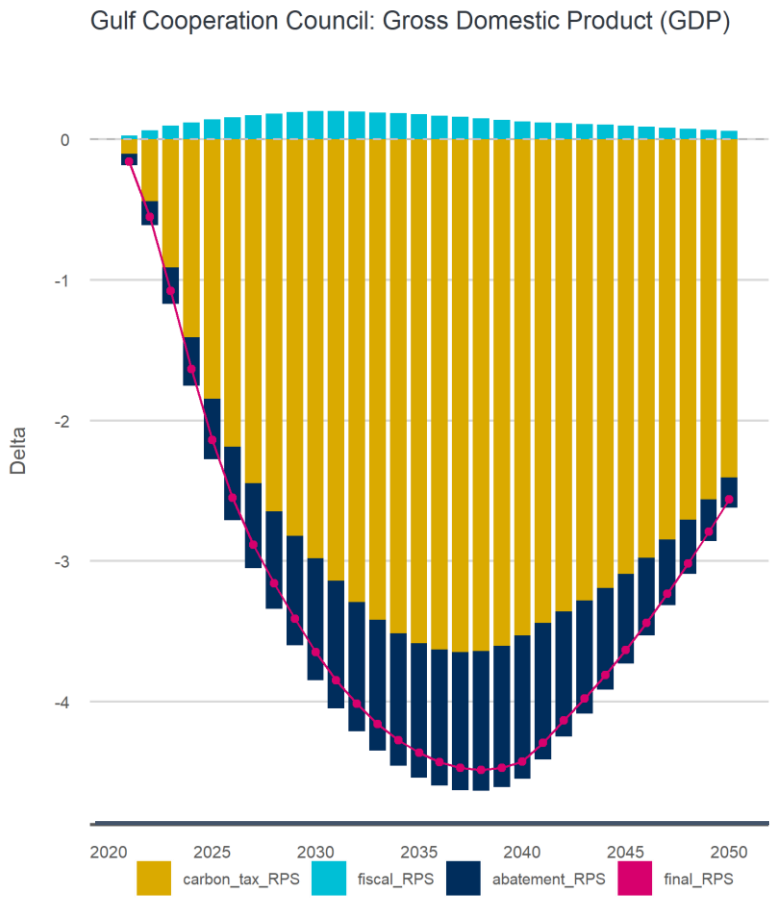
Real GDP cumulative transitional impacts: Eurasia, Russia

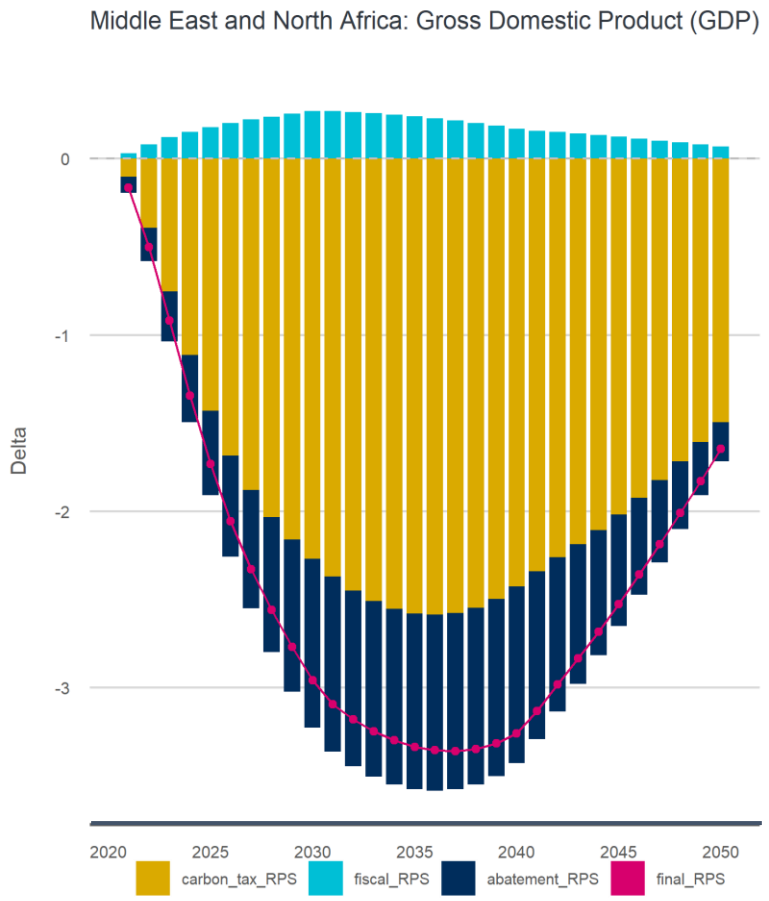


- Russia and Eurasia see a significant impact from RPS in their economies by 2050.
- Carbon tax impacts in these economies are one of the highest across IPR countries/regions. Demand of FF exports decline along with FF prices.
- Abatement costs are mild in Russia before 2030. By 2040 Russia has the highest abatement impact across all countries.
- As a result of early policy action under RPS, negative real GDP impacts by 2050 are less severe compared to FPS.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: Gulf Cooperation Council, Middle East and North Africa

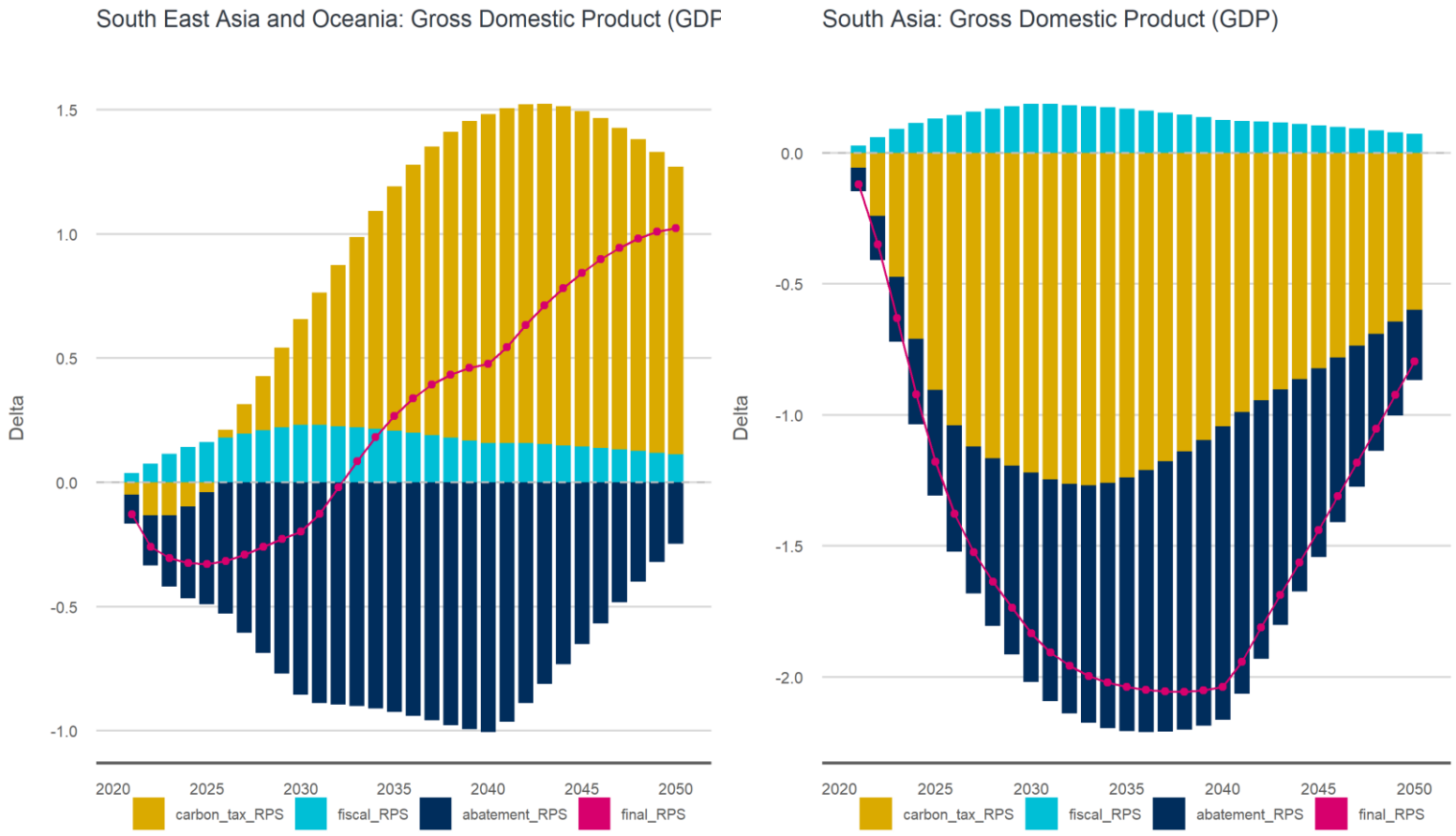




- Middle East /North Africa and GCC economies see substantial impacts from RPS by 2037.
- Carbon taxes impact these economies the most as a result of reduced demand of FF exports and lower FF prices.
- Fiscal shock benefits are close to the country average given these economies start to decarbonise by 2030s, despite a gradual increase in carbon prices.
- Abatements costs are relatively low for both regions by 2030.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

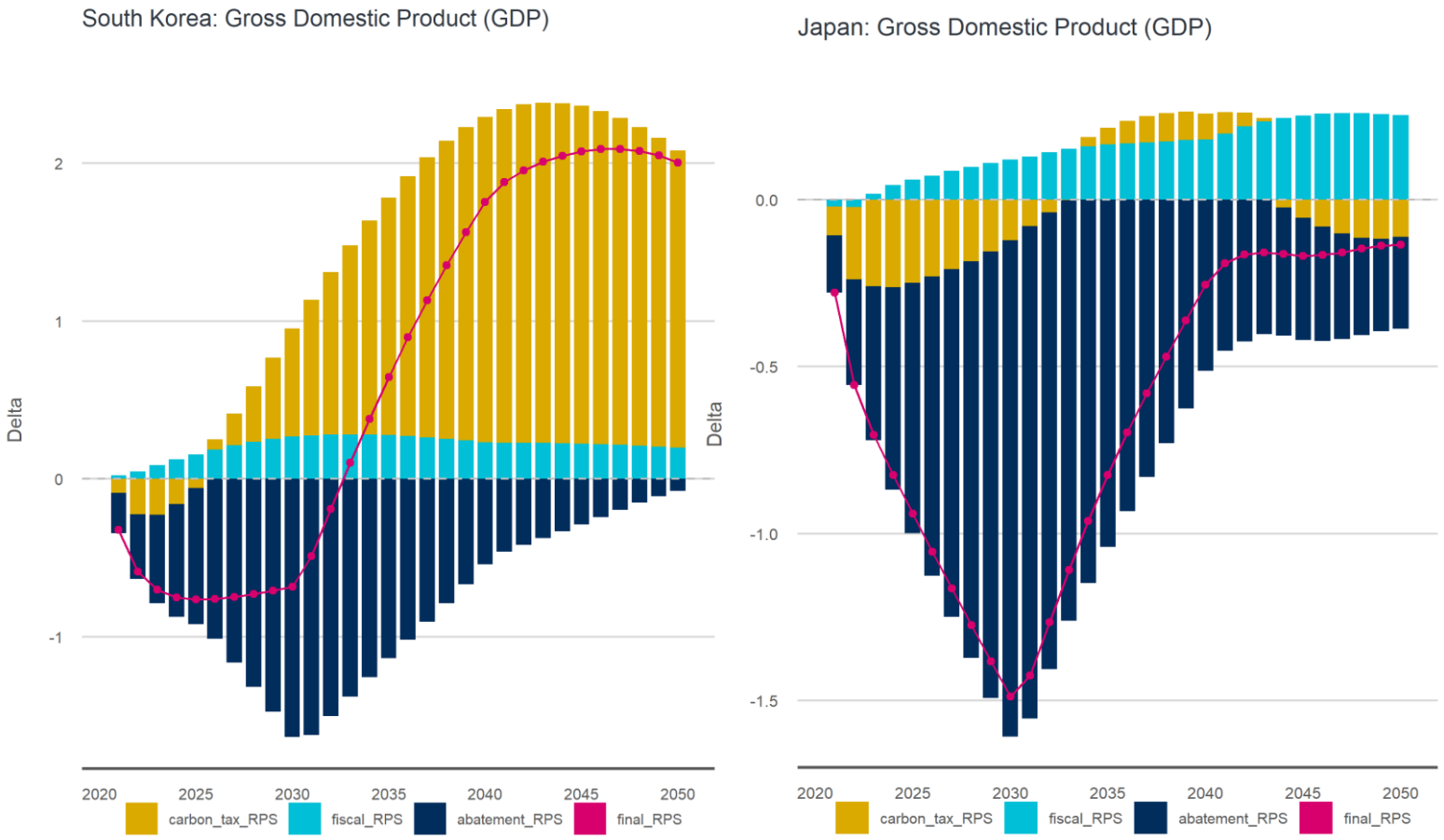
Real GDP cumulative transitional impacts: South East Asia and Oceania, South Asia



- South East Asia and Oceania (SEAO) sees only minor impacts from RPS in contrast to the South Asia (SA) region.
- Whilst SA sees no significant reduction of emission until late 2040s, SEAO sees emissions drop just before 2030. This has an impact on the size of the carbon taxes.
- More importantly, SA relies heavily on FF exports which are expected to decline in volume and price.
- SEAO countries also see trade contributing positively to the economy in the second half of the scenario.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

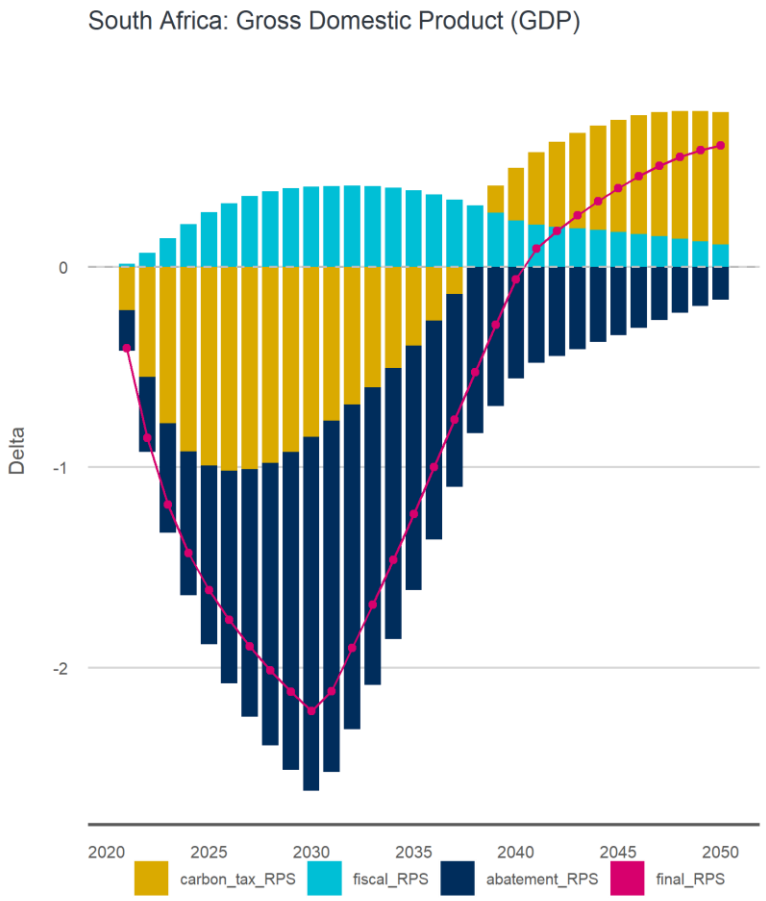
Real GDP cumulative transitional impacts: Japan, South Korea

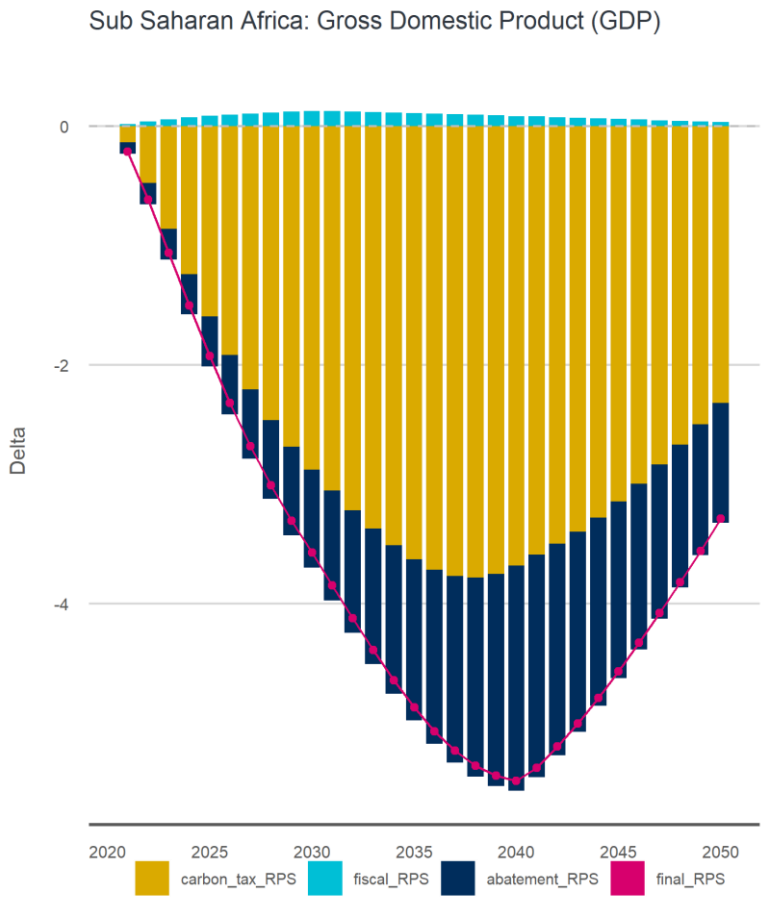


- Impact in Japan and South Korea (SK) are distinctively different. Whilst both achieve a positive impact by 2050, Japan's carbon tax shock impact is more severe compared to SK.
- Differences in the basket of imports between countries drive differences in inflation paths under FPS. Lower inflation in SK support household consumption after 2030, boost real GDP, and provide a more supportive monetary policy compared to Japan.
- Abatements costs are similar in both economies (close to the average of all countries).

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Real GDP cumulative transitional impacts: South Africa, Sub Saharan Africa





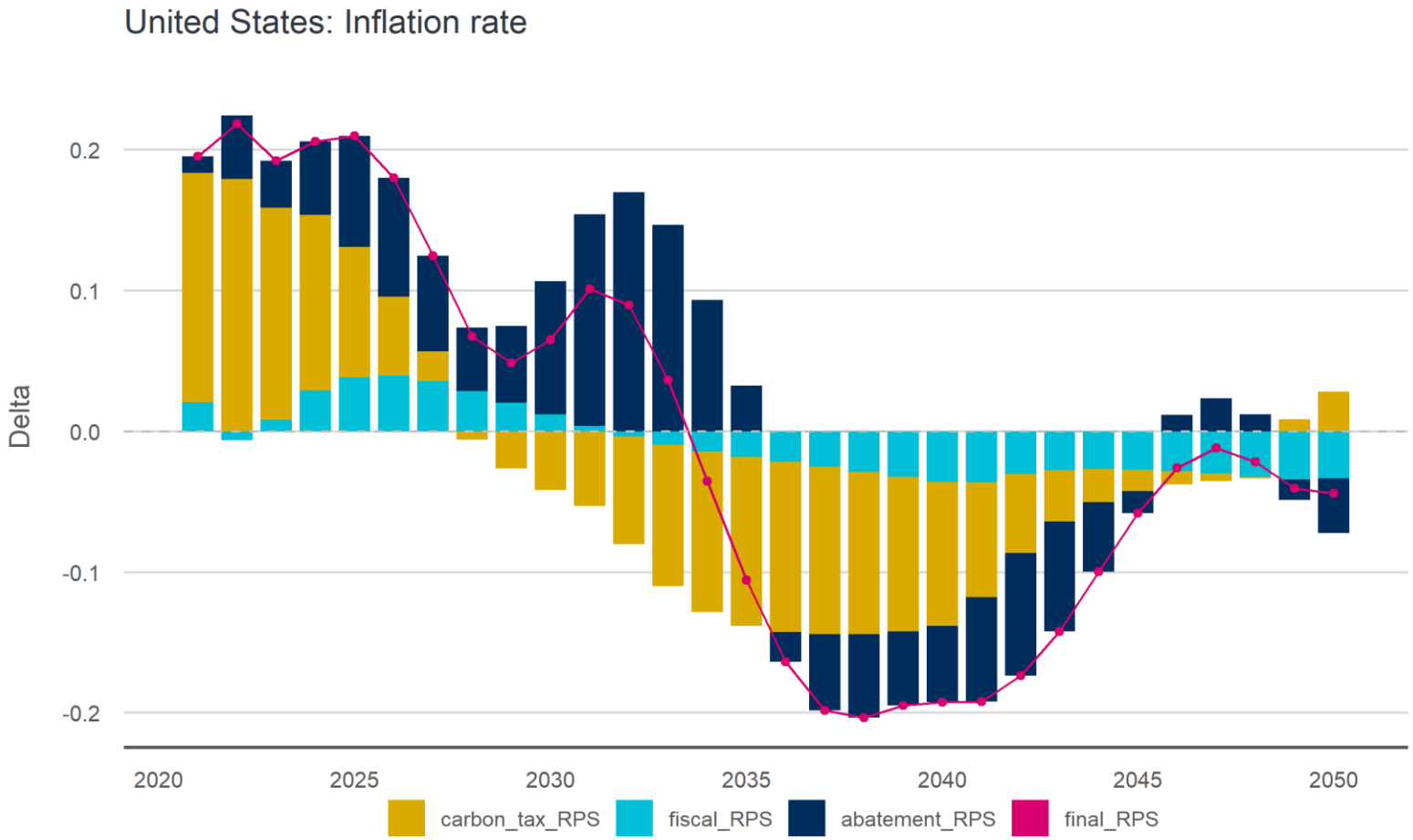
- Sub-Saharan Africa (SSA) sees significant impacts from the carbon tax compared to most economies.
- This is driven by lower demand for FF exports vs baseline. A decline in FF prices has a negative impact on these economies as well.
- Abatement impacts are relatively high for SSA after 2040.
- South Africa (SA) sees a quick decarbonisation with carbon prices increasing as per OECD countries. As a result, impacts appear relatively similar to those countries.
- Abatement impacts for SA are below average by 2050.

Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Inflation rate

INEVITABLE POLICY RESPONSE

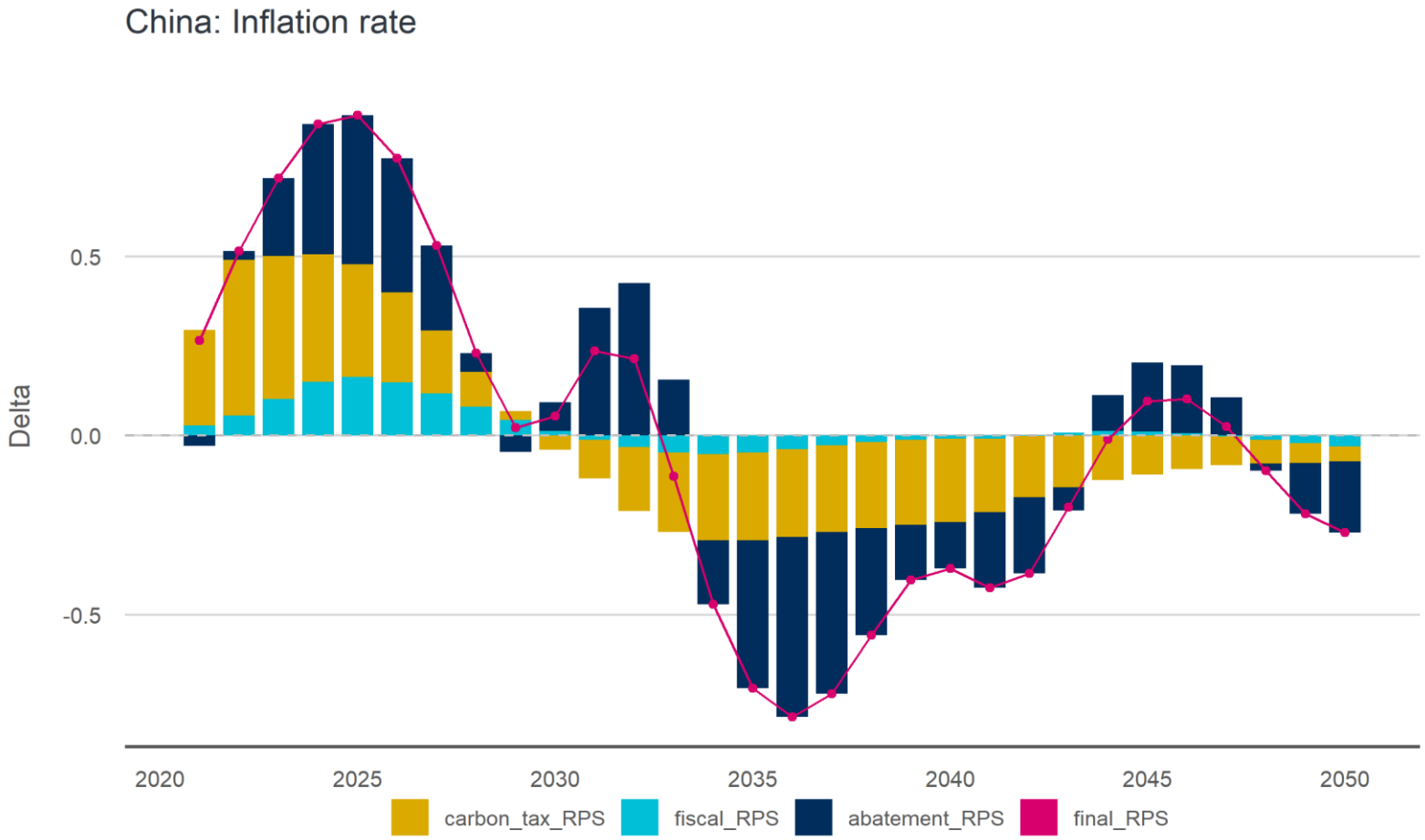
Inflation rate cumulative transitional impacts: United States



- In the United States, inflation is higher in RPS than in the baseline scenario until 2033, although not significantly. After 2033, the inflation rate in RPS is lower than in baseline.
- Inflation increments before 2030 comes via the carbon tax shock. This is the result of increments in carbon prices.
- Deflationary pressures compared to baseline occur as emission are reduced and the basket of imports of goods reflect a decline in FF consumption.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

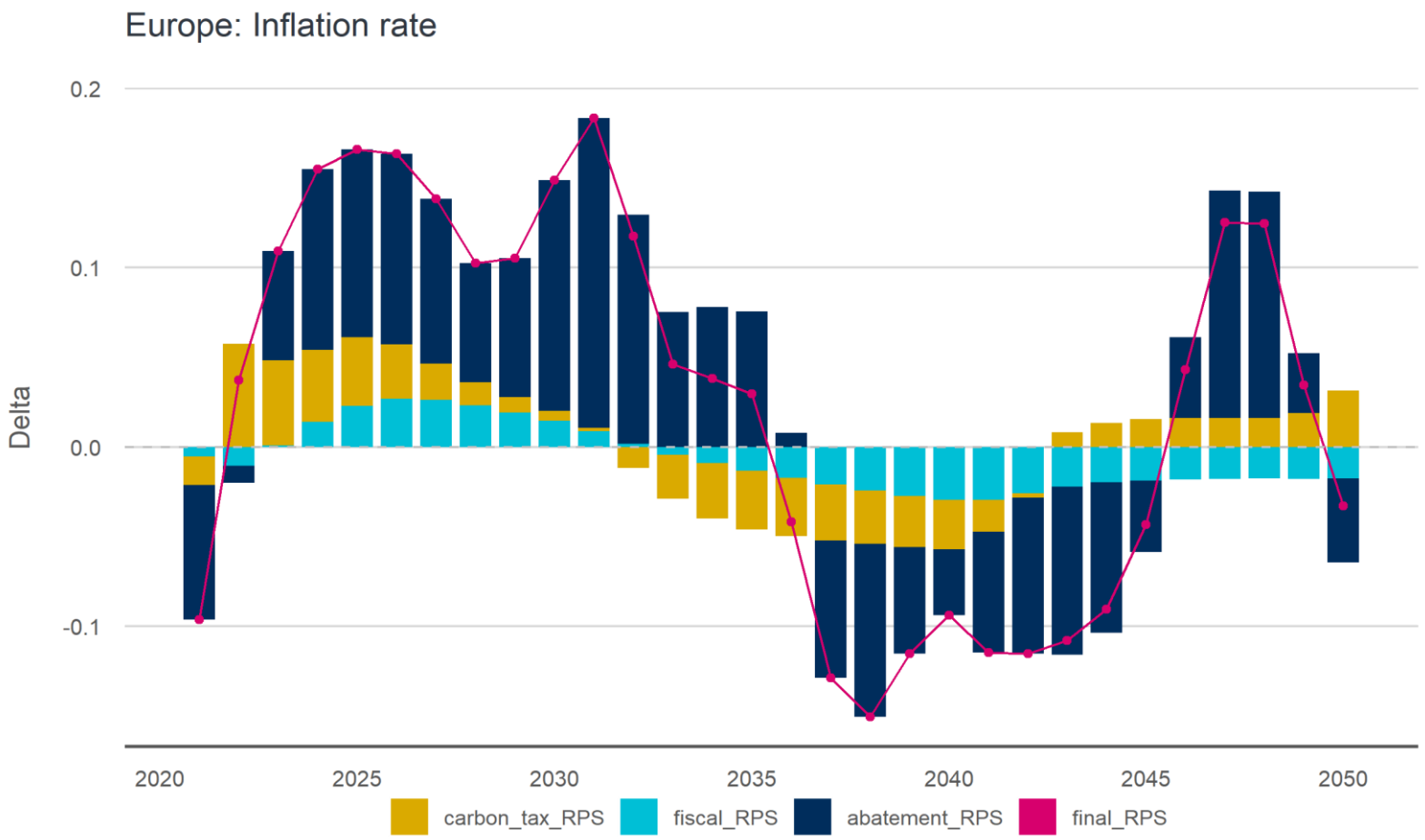
Inflation rate cumulative transitional impacts: China



- The inflation rate in China under RPS is expected to be significantly higher compared to baseline until 2032. Differences are significant up to 2040.
- In line with the US, inflation in the first decade comes predominately from carbon taxes.
- Inflation projections in China are slightly more volatile than in other economies given the monetary policy in China is expected to act jointly with the US policy. This doesn't allow monetary policy to provide stability to prices.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

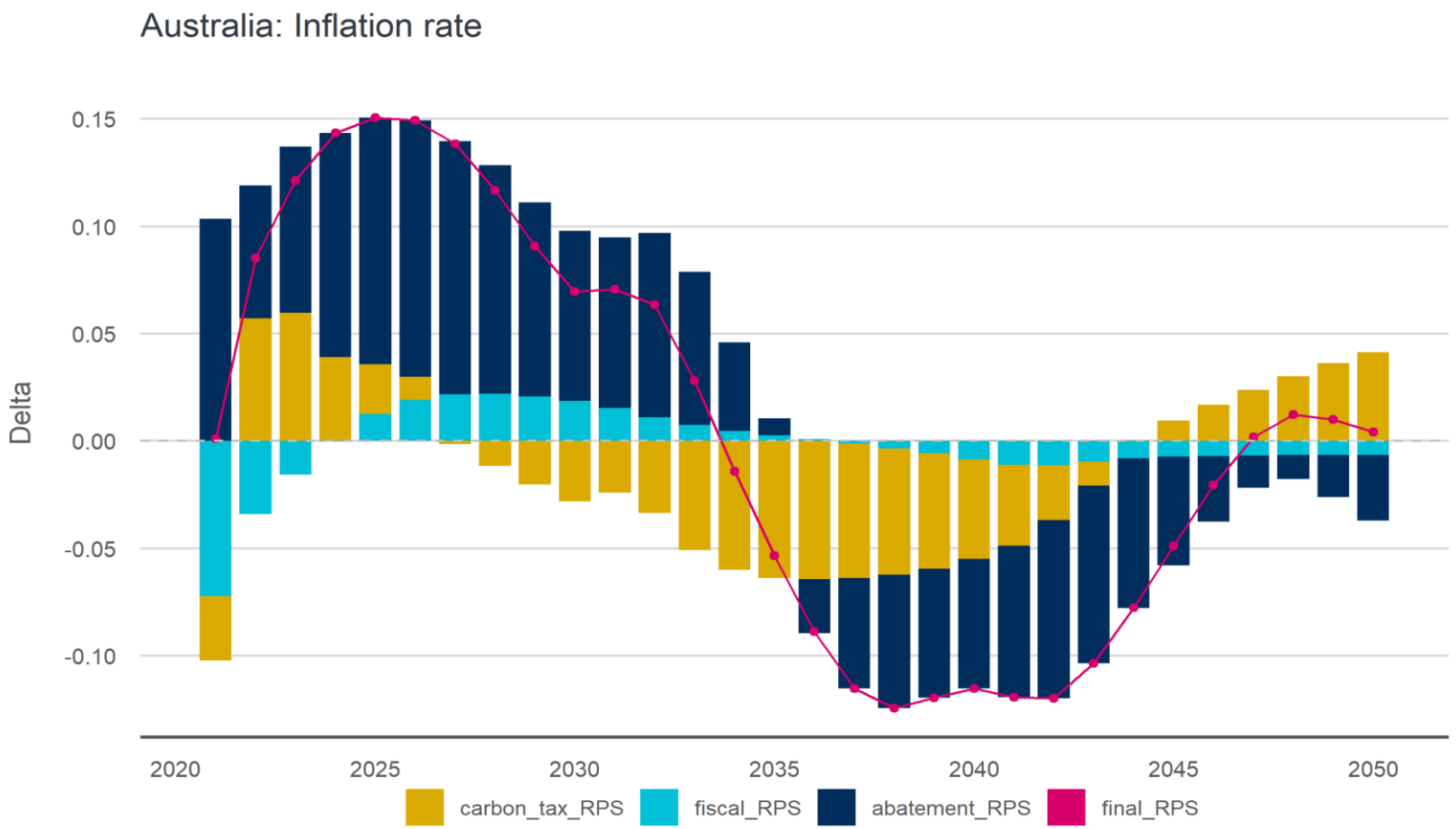
Inflation rate cumulative transitional impacts: Europe



- Inflation rate in Europe is expected to be slightly higher in RPS than in baseline until 2034.
- However, differences against baseline are not significant (see left hand side axis).
- Inflation in these countries is driven primarily by abatement costs over the first 10 years of projections.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Inflation rate cumulative transitional impacts: Australia

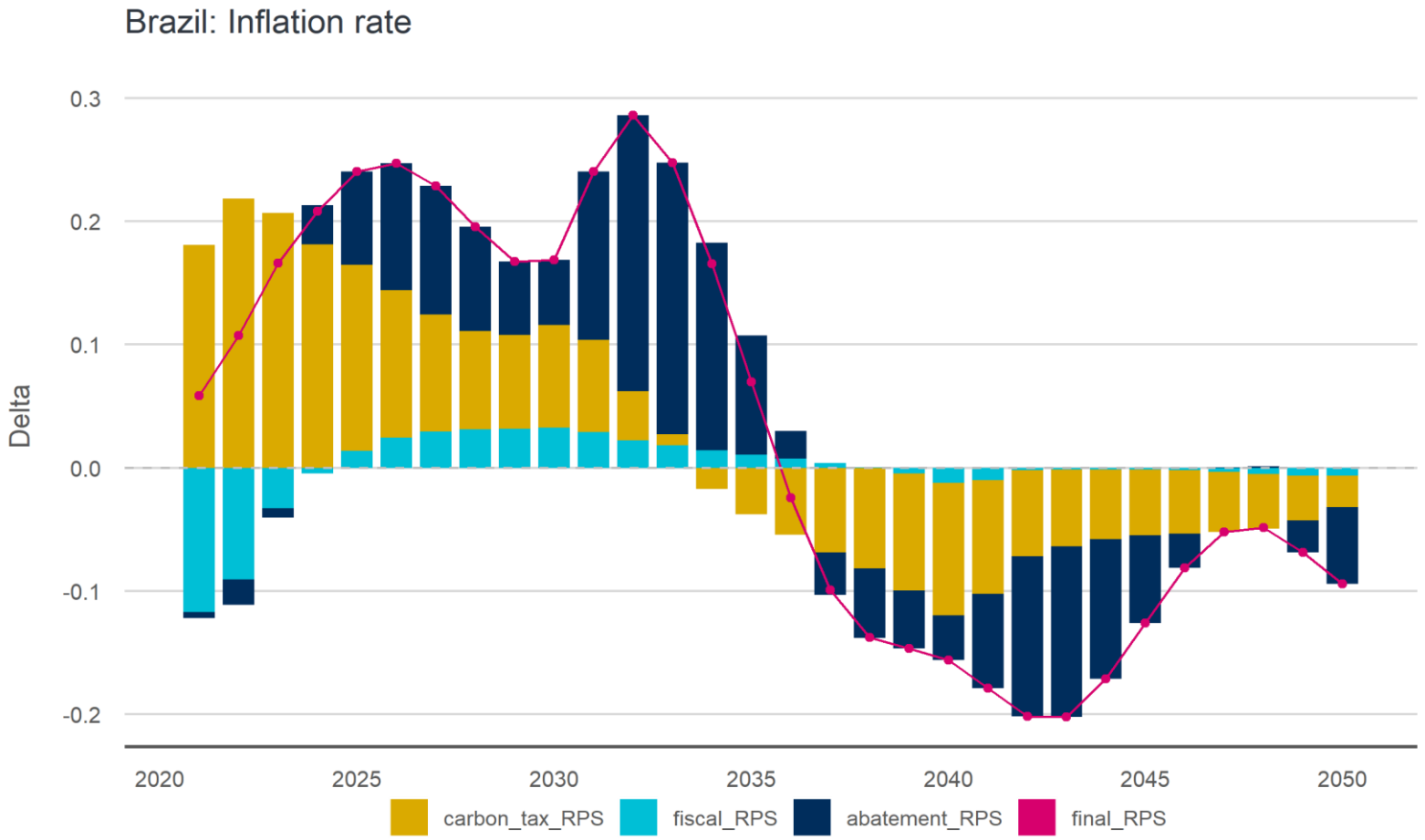


- In line with other OECD countries Australia's inflation rate paths see minor differences between RPS and baseline.
- The majority of inflationary pressures are driven by carbon taxes.
- However, Australia see relatively low impact from carbon taxes compared to OECD countries.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Inflation rate cumulative transitional impacts: Brazil

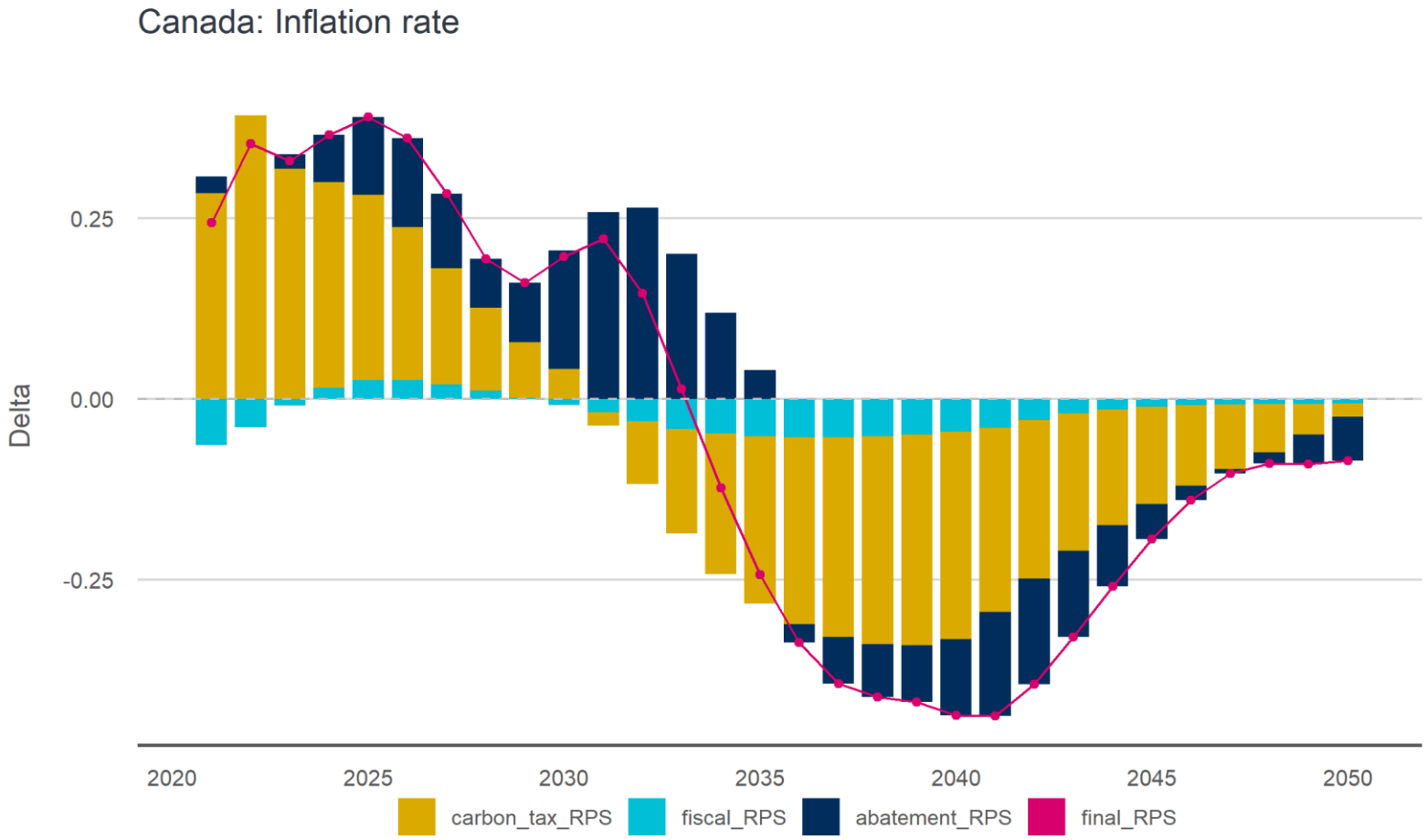


- The inflation rate in Brazil in the RPS scenario is expected to remain above the baseline until 2035, although differences are not significant. After 2035, the inflation rate in RPS is slightly below the baseline.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

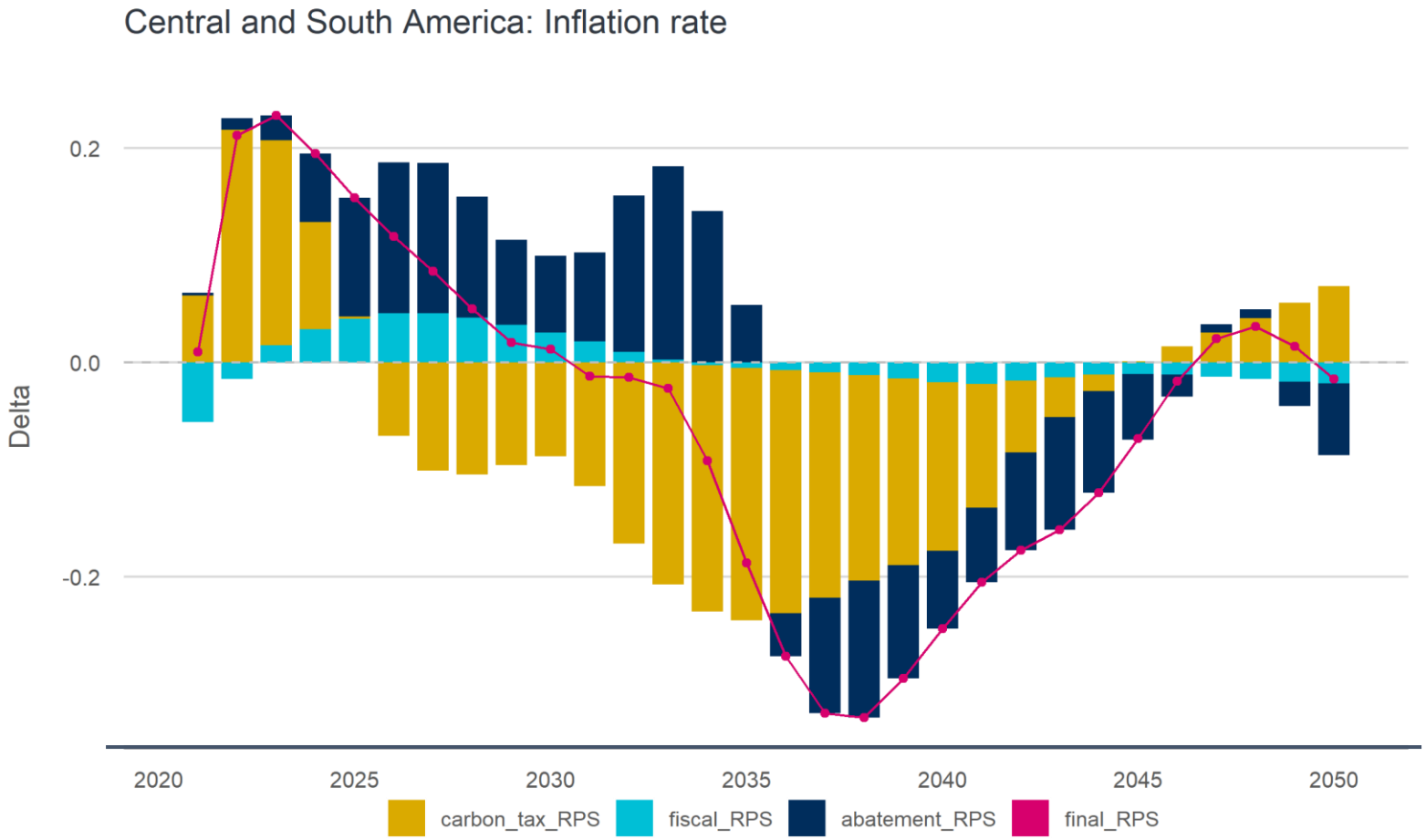
Inflation rate cumulative transitional impacts: Canada



- Canada sees the inflation rate jump above baseline in the first 5-7 years of the transition.
- This is the result of carbon prices growing faster than in other OECD countries.
- Canada is expected to cut emissions early on, and therefore, inflationary pressures ease for the rest of the transition period.
- Deflationary pressures are also driven by lower FF prices later on the scenario.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

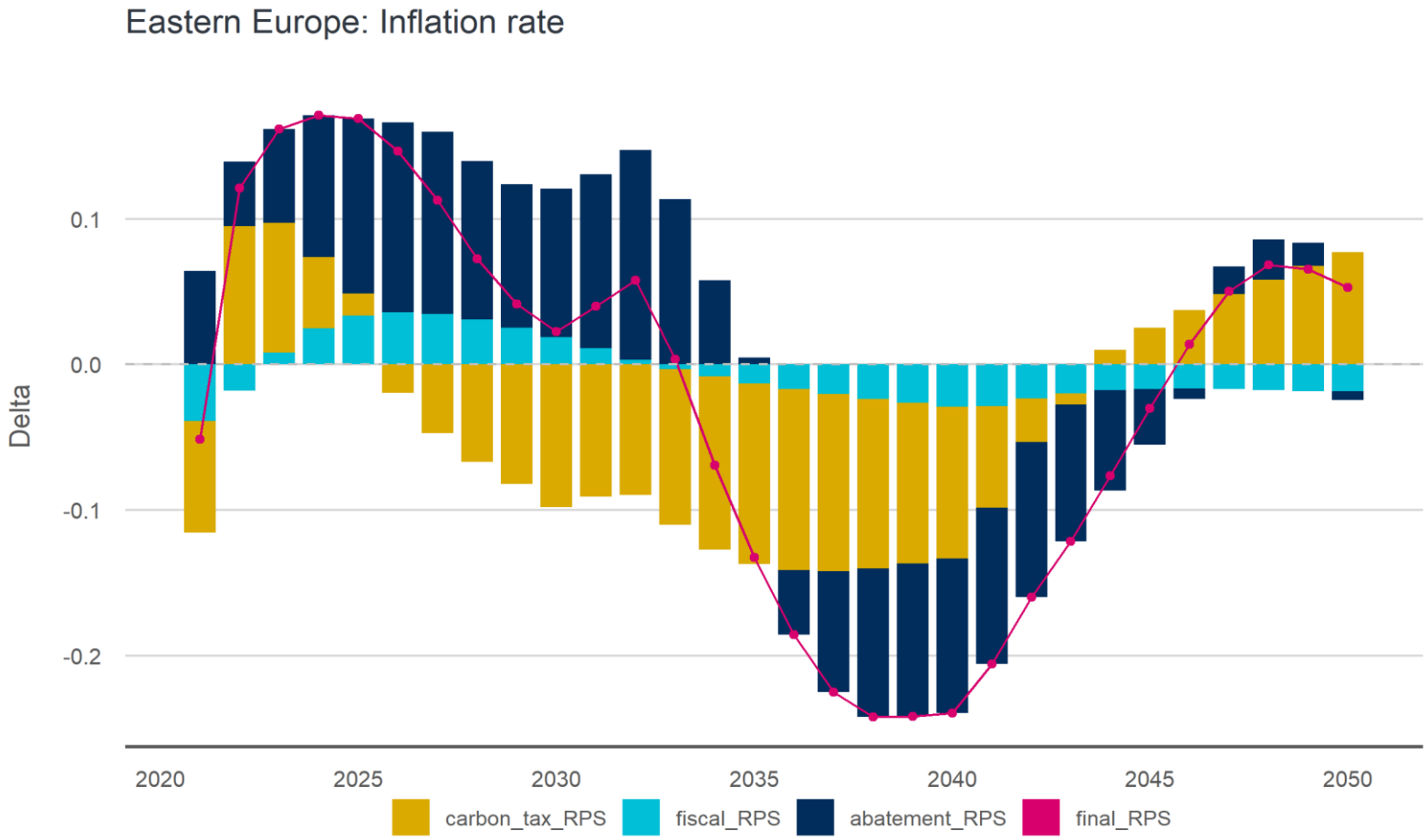
Inflation rate cumulative transitional impacts: Central and South America



- In line with other countries, Central and South America see a surge in inflation over the first decade of projections.
- In Central and South America, inflation rate is expected to not differ significantly between the baseline and the RPS scenario.
- Deflationary pressures later in the scenario are also driven by lower FF prices.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Inflation rate cumulative transitional impacts: Eastern Europe

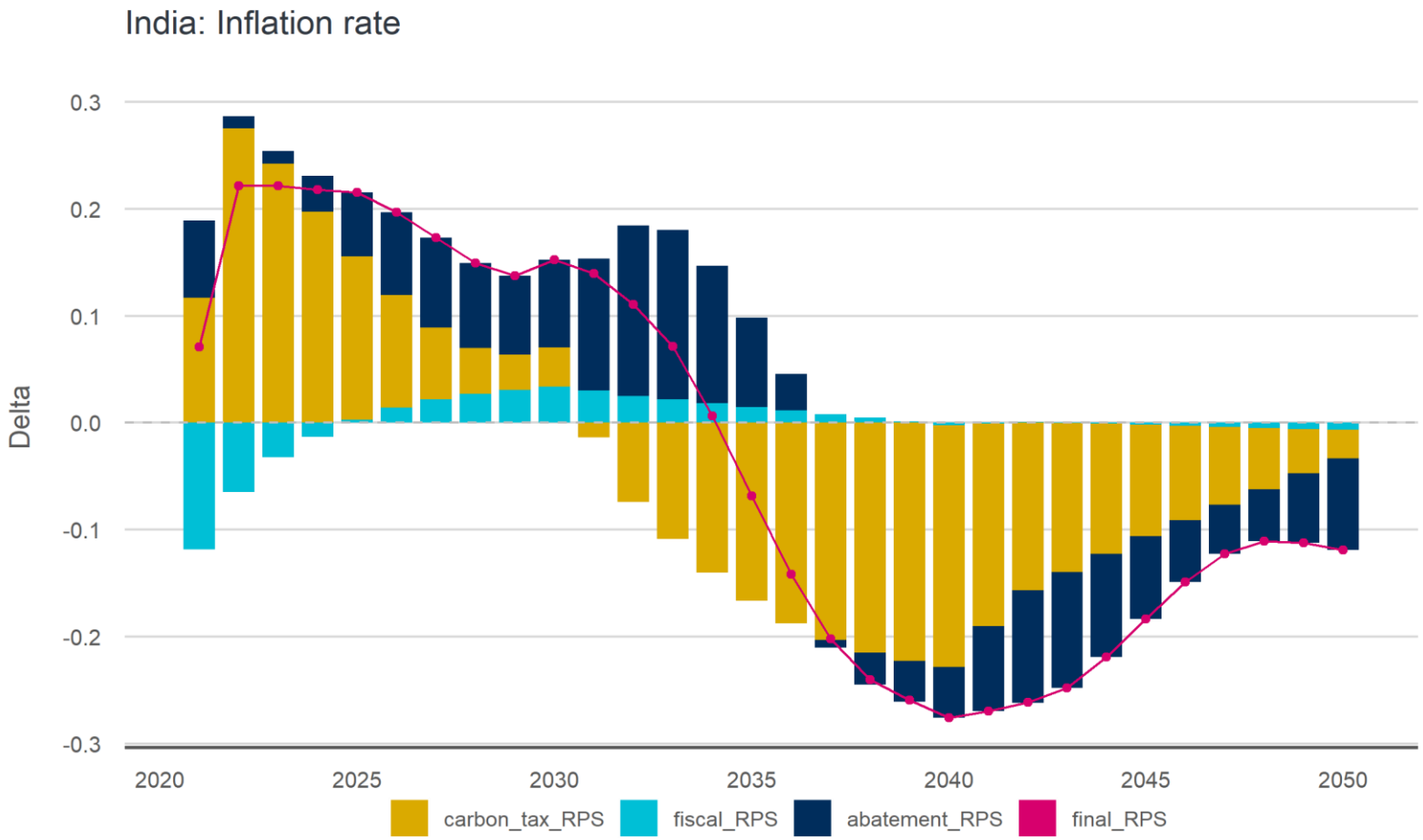


- No significant deviations in Eastern European countries inflation rate paths between RPS and baseline scenarios.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Inflation rate cumulative transitional impacts: India

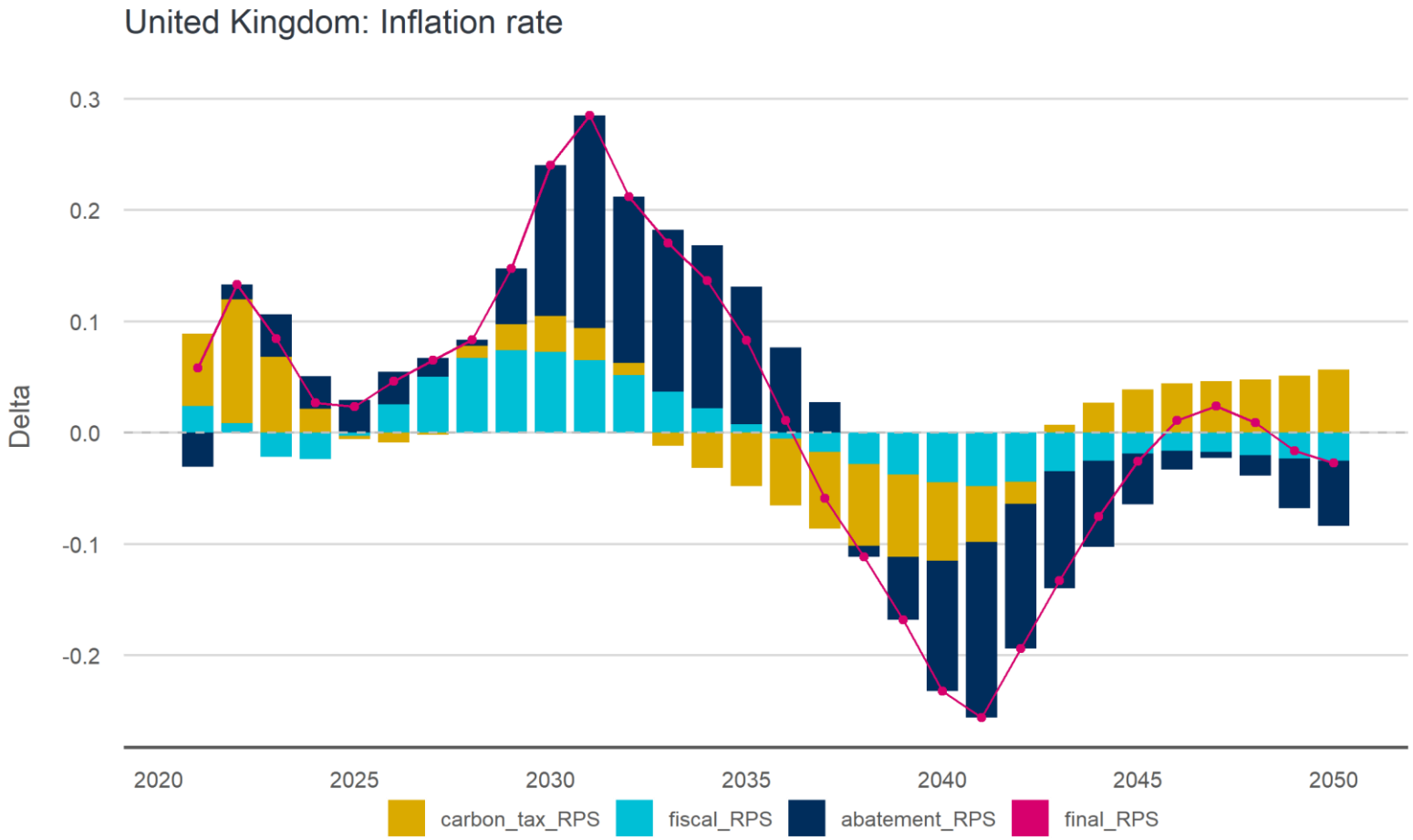


- In India, the inflation rate under RPS is not significantly different when compared to the baseline (see left-hand side axis).
- For first decade of the projection period, inflation is above baseline as a result of carbon taxes introduced in the economy.
- Given emissions only start to decrease in India under RPS after 2030, this prolongs the inflationary pressures until 2034 when lower FF prices ease any inflationary pressures.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

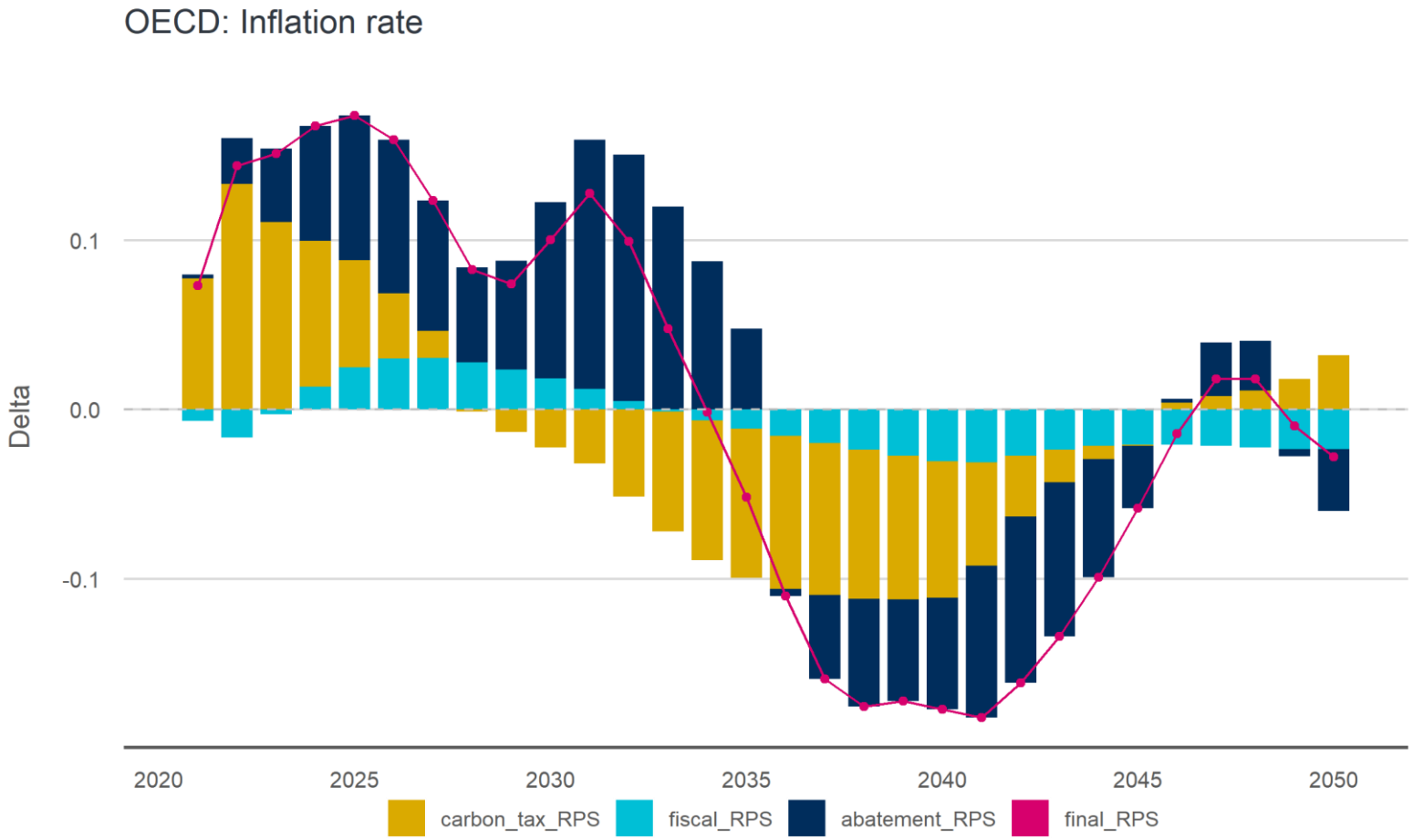
Inflation rate cumulative transitional impacts: United Kingdom



- In the UK, the inflation rate shows a surge in inflation for the first decade of projection as a result of increasing carbon prices.
- Fluctuations in inflation compared to baseline after 2034 respond to lower FF prices and other business cycle factors.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

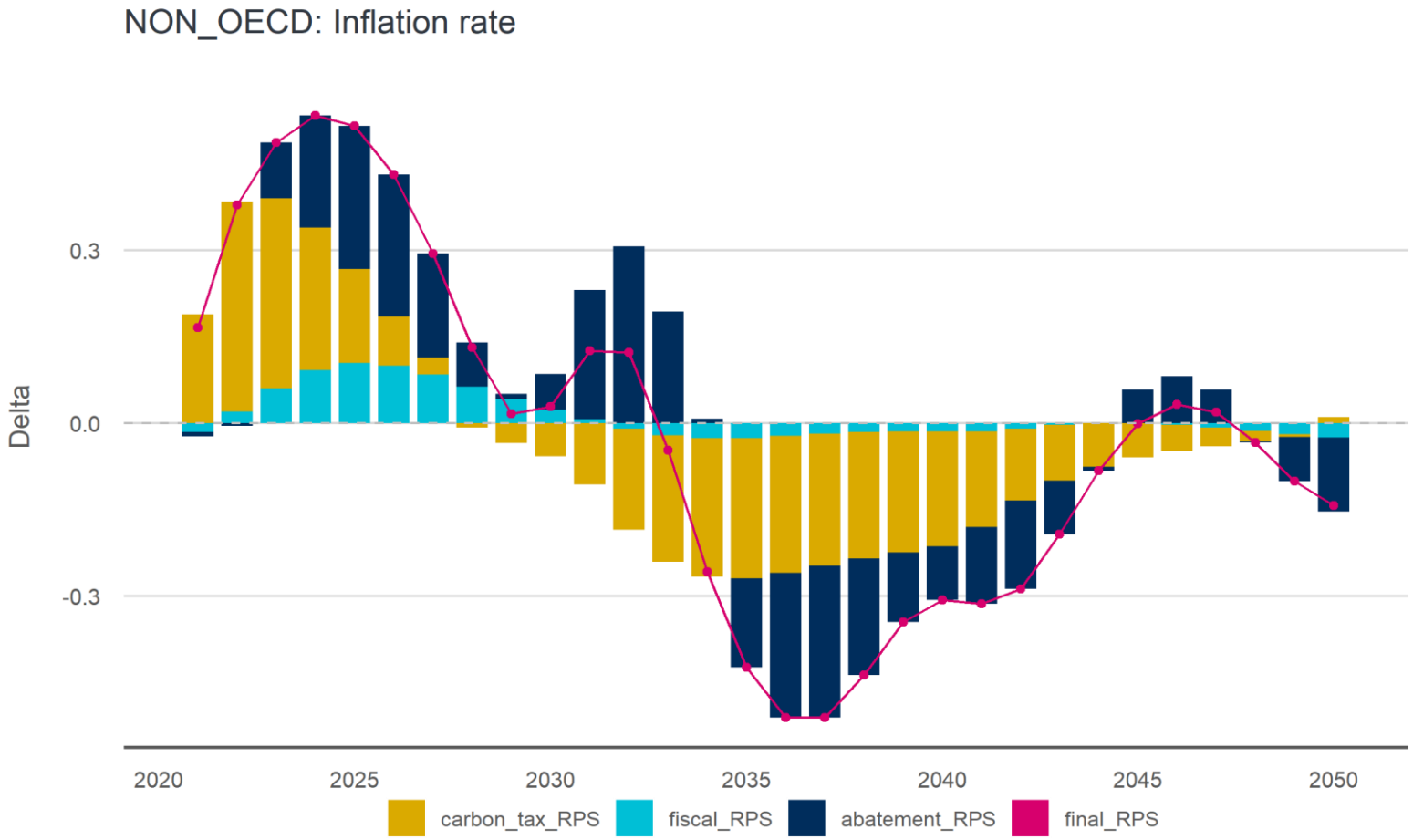
Inflation rate cumulative transitional impacts: OECD



- The inflation rate in OECD countries is expected to be higher in RPS compared to the baseline until 2033, after which the inflation rate in RPS is lower than in the baseline scenario.
- Differences between scenarios are not significant.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Inflation rate cumulative transitional impacts: Non-OECD

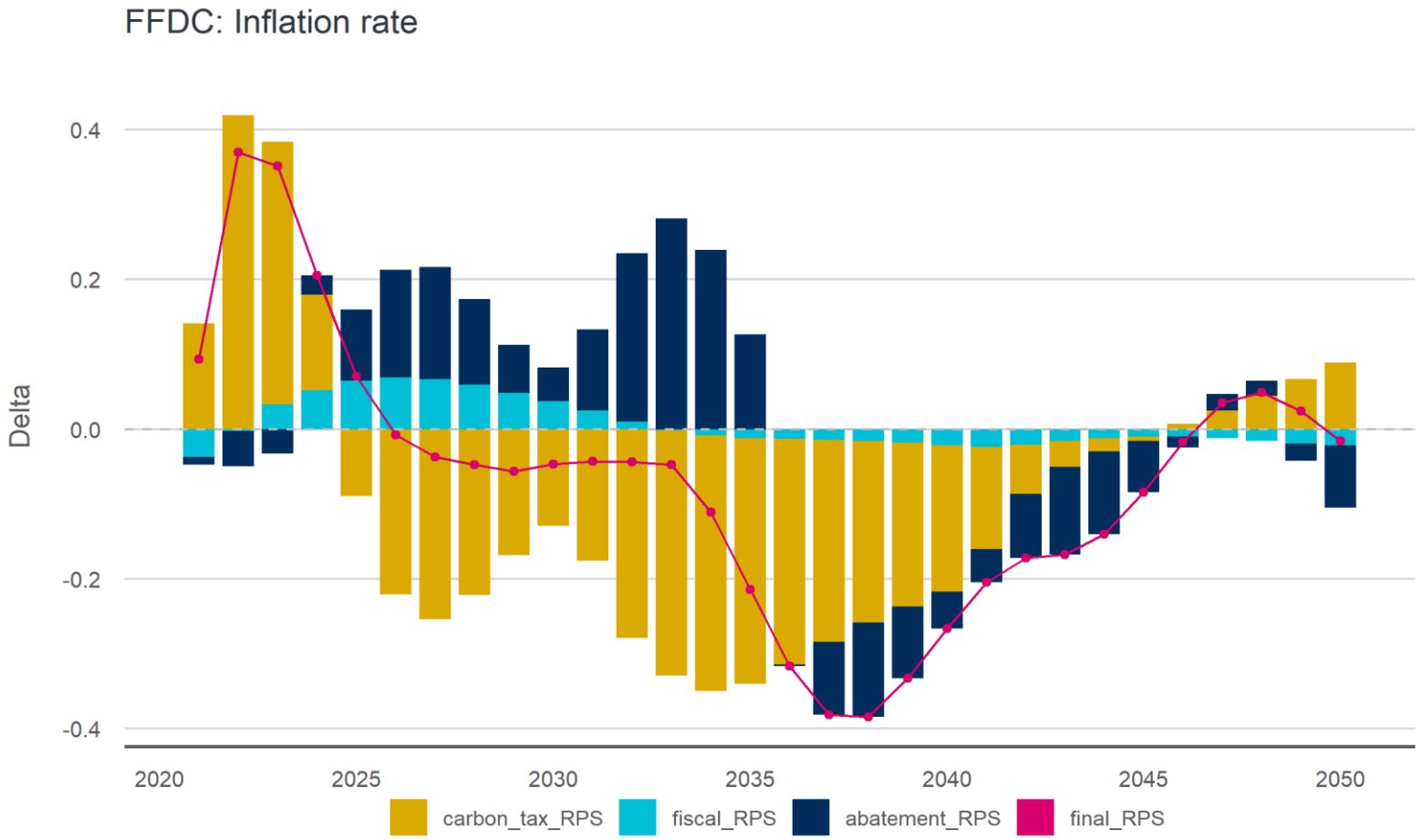


- The inflation rate in Non-OECD countries is expected to be higher in RPS compared to the baseline until 2032, after which the inflation rate in RPS is lower than in the baseline scenario.
- A combination of slow decarbonisation and increasing carbon prices will push inflation higher than in OECD countries.
- As the demand for FF declines, the impact of FF prices on inflation shrinks. Non-OECD countries that decarbonise more slowly are at risk of significant inflationary pressures from FF price fluctuations.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Inflation rate cumulative transitional impacts: FFDC



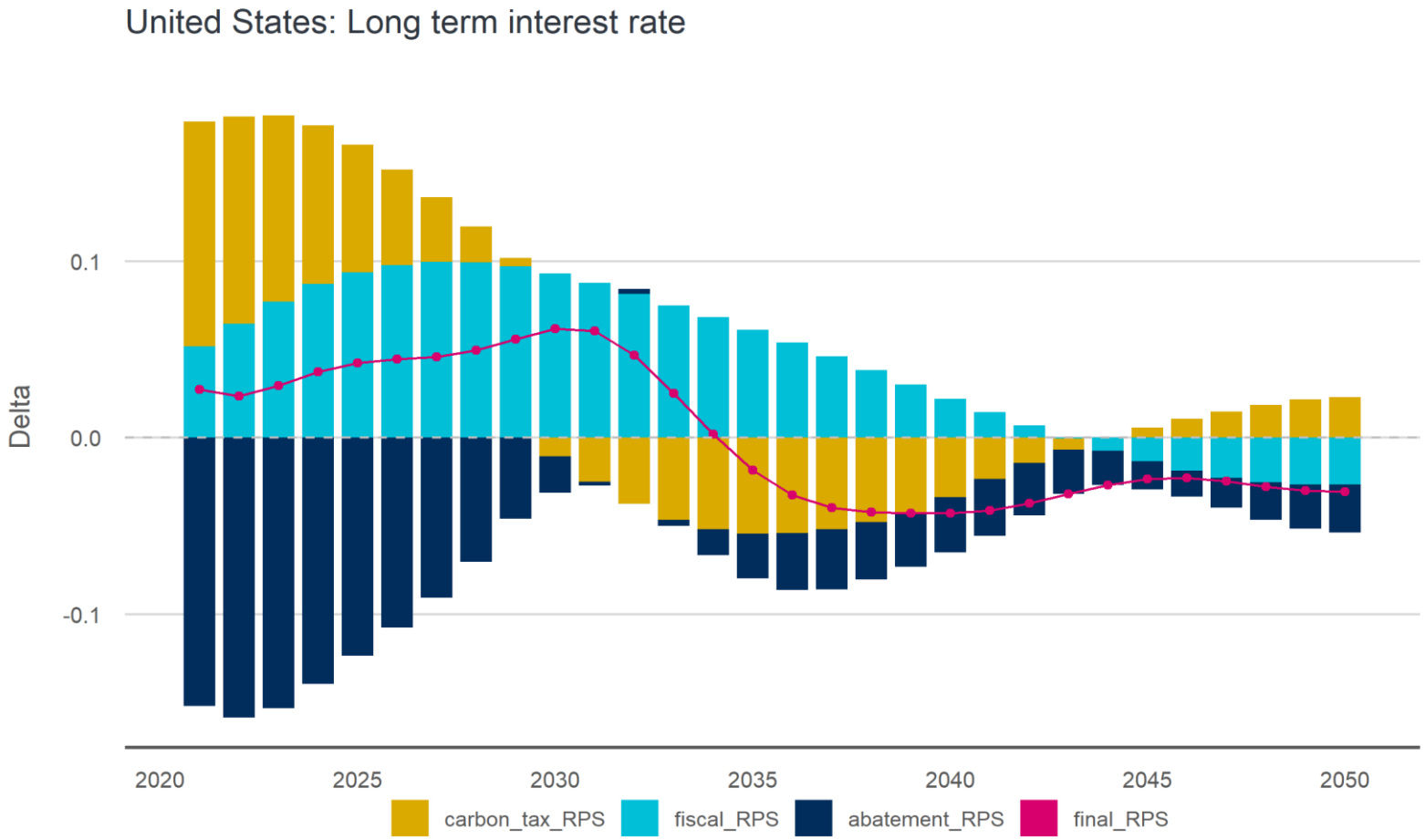
- The inflation rate in FFDC countries is expected to be slightly higher in the RPS scenario compared to the baseline until 2031.
- Afterwards, RPS inflation remains below the baseline until 2050, although not significantly.
- Carbon prices and abatement shocks impact inflation rate. Deflationary pressures are driven mostly as a result of lower FF prices.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

The Inevitable Policy Response:IPR 1.5°C RPS scenario – Long term interest rates

INEVITABLE POLICY RESPONSE

Long term interest rate cumulative transitional impacts: United States

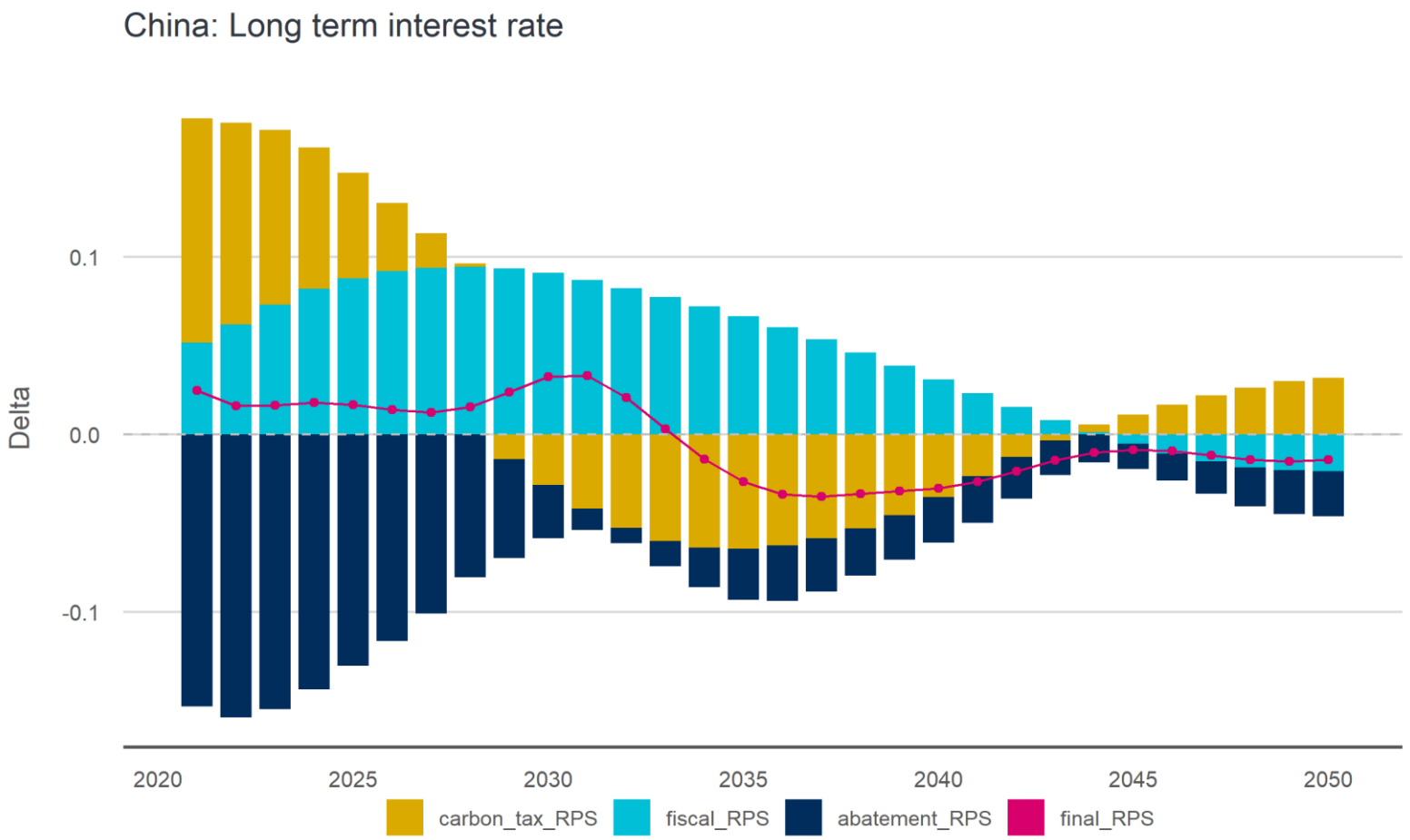


- Long term interest rates in the US are above the baseline for the first 13 yeas of projections but differences are not significant.
- Differences are driven by monetary policy movements in the US, which target both nominal GDP and inflation.
- Inflationary pressures triggered by the carbon tax during the first years push interest rates to peak by 2024.
- This is followed by fiscal stimulus that boosts both inflation and real GDP.
- As inflation dissipates rapidly differences between baseline and RPS disappear.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

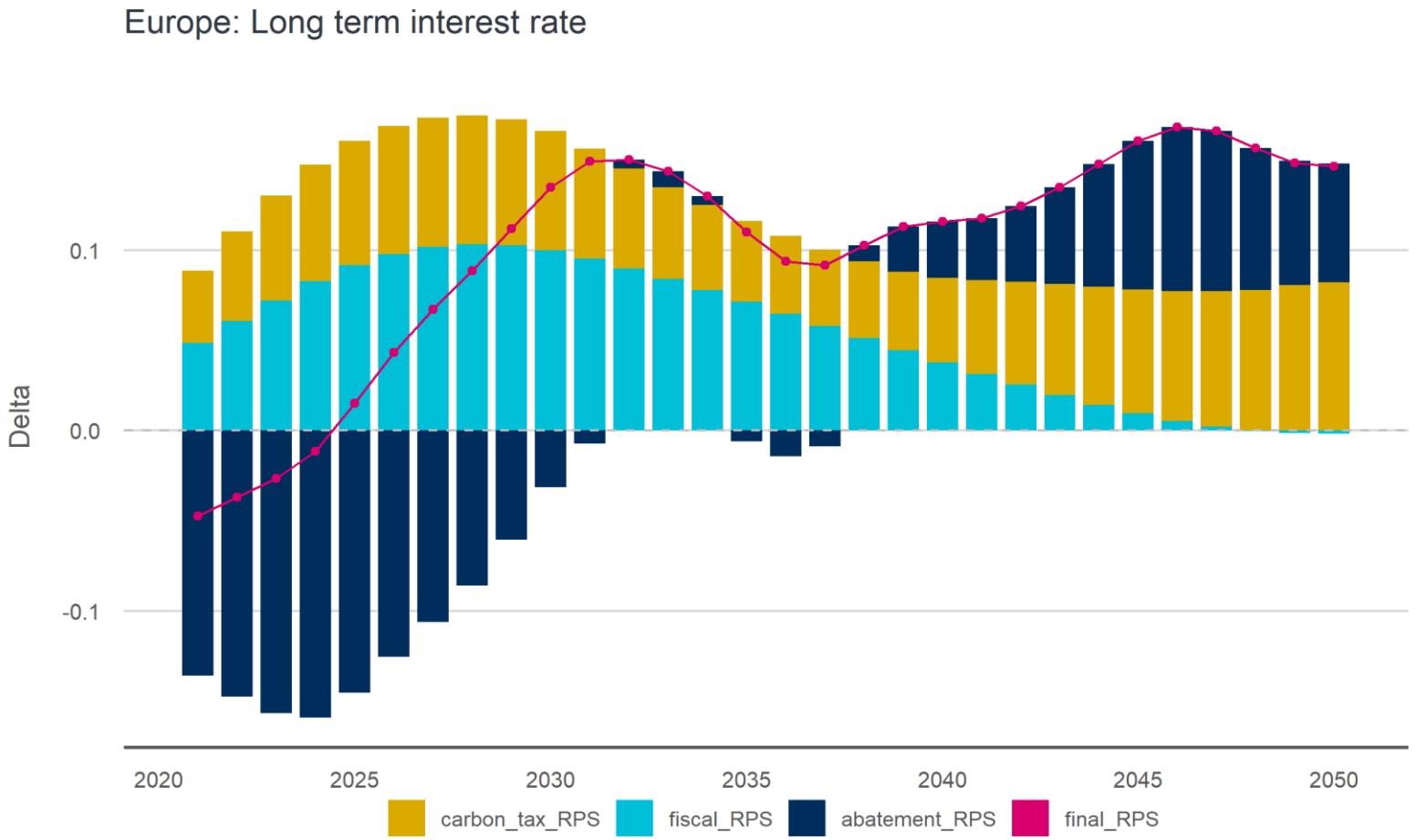
Long term interest rate cumulative transitional impacts: China



- The Chinese long term interest rate path delta follows a similar path to the US as monetary policy is aligned to the US's.
- China's currency is classified as a fixed exchange rate currency with reference to a basket of currencies, with the US dollar having the largest share in that basket. Until 2005 it was pegged to the US dollar, so US monetary policy continues to have influence in the monetary policy in China.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Long term interest rate cumulative transitional impacts: Europe



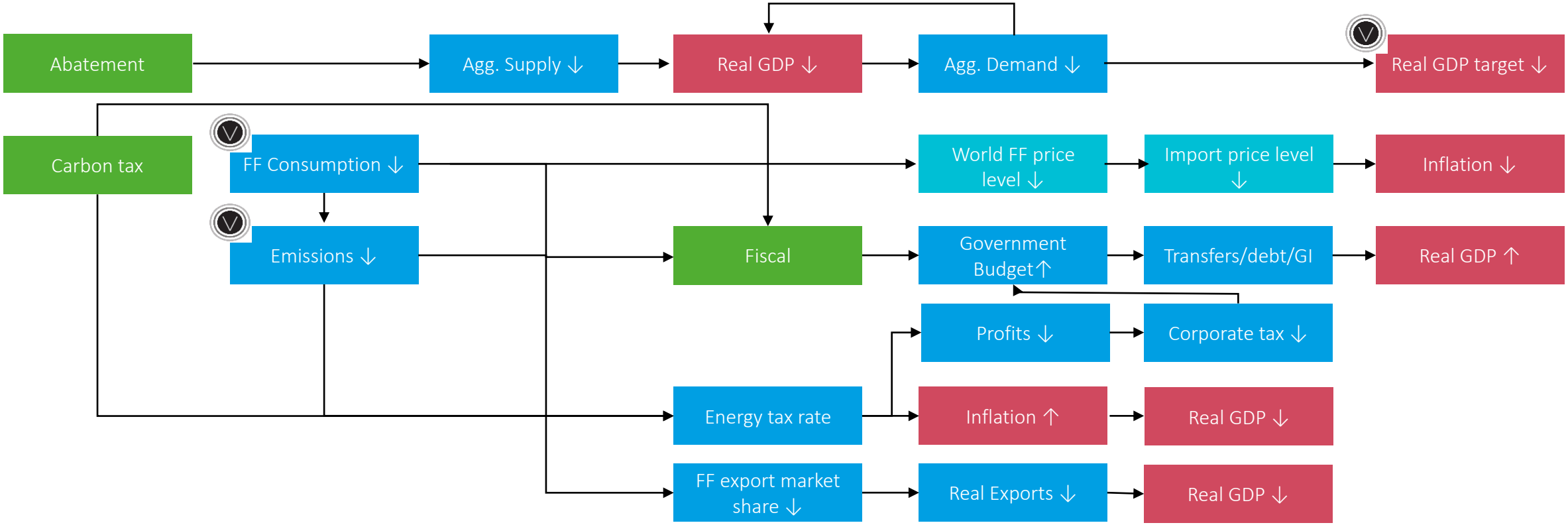
- RPS long term interest rates in Europe are above the baseline for the entire forecast period but differences are not significant (see the left-hand side axis).
- Short term differences are driven by higher inflation compared with baseline. Inflation is driven by carbon tax and abatement costs.
- As the abatement costs shrink in the second half of the forecast horizon in RPS, nominal GDP is above target triggering further interest rate hikes but with limited impact compared to baseline.

Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: methodology

INEVITABLE POLICY RESPONSE

IPR RPS shocks flow through different variables in a sequential way



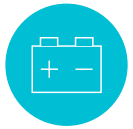
Source: Vivid Economics

Each shock aims to capture a different aspects of climate change transition with some limitations

	What is included	What is excluded
Carbon tax shock	• Impact of carbon tax into domestic energy fossil fuel prices, and lower consumption of FF into world FF prices • Impact on profits and inflation • Impact on exports for FF producer	• Impact of carbon tax into FF consumption and emissions (this is modelled in the Energy model) • Impacts from carbon tax revenues are modelled in the fiscal shock • Impact from disinvestment on FF supply and World FF prices
Fiscal policy shock	• - Recycling of carbon tax revenues through government investment, household transfers, and debt payment	• Any distribuibutional or sectoral impacts from carbon tax revenue recycling • Any endogenous changes in the profile of tax payers • Government investment doesn't change the productive capacity of the economy. • Knock-on effects on interest rates and premia from debt changes.
Abatement shock	• Costlier energy system (energy becomes more expensive, so less needs to be produced in the economy). This includes any CAPEX and OPEX costs by technology country and year	• Sectoral breakdown of abatement costs. NIGEM doesn't have sectoral breakdown of sectors.

INEVITABLE POLICY RESPONSE

Vivid Economics built the assumptions for the macroeconomic model based on the IPR's energy results



Energy

- Climate change scenarios made public (by NGFS, BoE) assume that energy intensity (energy used per unit of output) in the economy decreases as a result of the transition. In IPR it was assumed that a costlier energy system will not come at the expense of a decrease in energy intensity.
- As a result, Vivid Economics produced abatement costs (CAPEX and OPEX as a share of GDP) which capture the cost to the economy of making the transition. In other climate change scenarios, the cost to the economy from the transition comes due to lower energy intensity, which creates a productivity shock that propagates through the economy.
- The impact of carbon taxes on fuel consumption are modelled within the macroeconomic model in other climate change scenarios. For IPR this happens within Vivid's energy model. Similarly, emissions in IPR (FPS and RPS) are modelled in Vivid's energy model and not in the macroeconomic model.

Carbon tax revenues recycling

- In other climate change scenarios carbon tax revenue is recycled through 50% towards debt and 50% towards government investment. IPR's FPS and RPS scenarios take a wider set of options by including other forms of government intervention (household transfers) in revenue recycling.

INEVITABLE POLICY RESPONSE

NIGEM model highlights

Why a Global Macro-econometric model?

- Explicitly deals with interrelationships between different countries in the world.
- Represents the circular flow of income and secondary effects.
- Simulates behaviour of all economic agents (e.g., firms, households, government and central bank).
- Models intertemporal decisions of the economic agents (rational or adaptive expectations).
- Stacks shocks to see how each the impact of each on the economy.
- Estimates historical relationships of macroeconomic variables.

Upside

- It models the financial side of the economy alongside with the real side.
- Calculates interest rates, inflation, exchange rates and other financial variables.
- Includes more than 50 countries/regions.
- It includes energy as an input into the production function.
- It was used for the NGFS and BoE climate change scenarios released in 2021.

Limitations

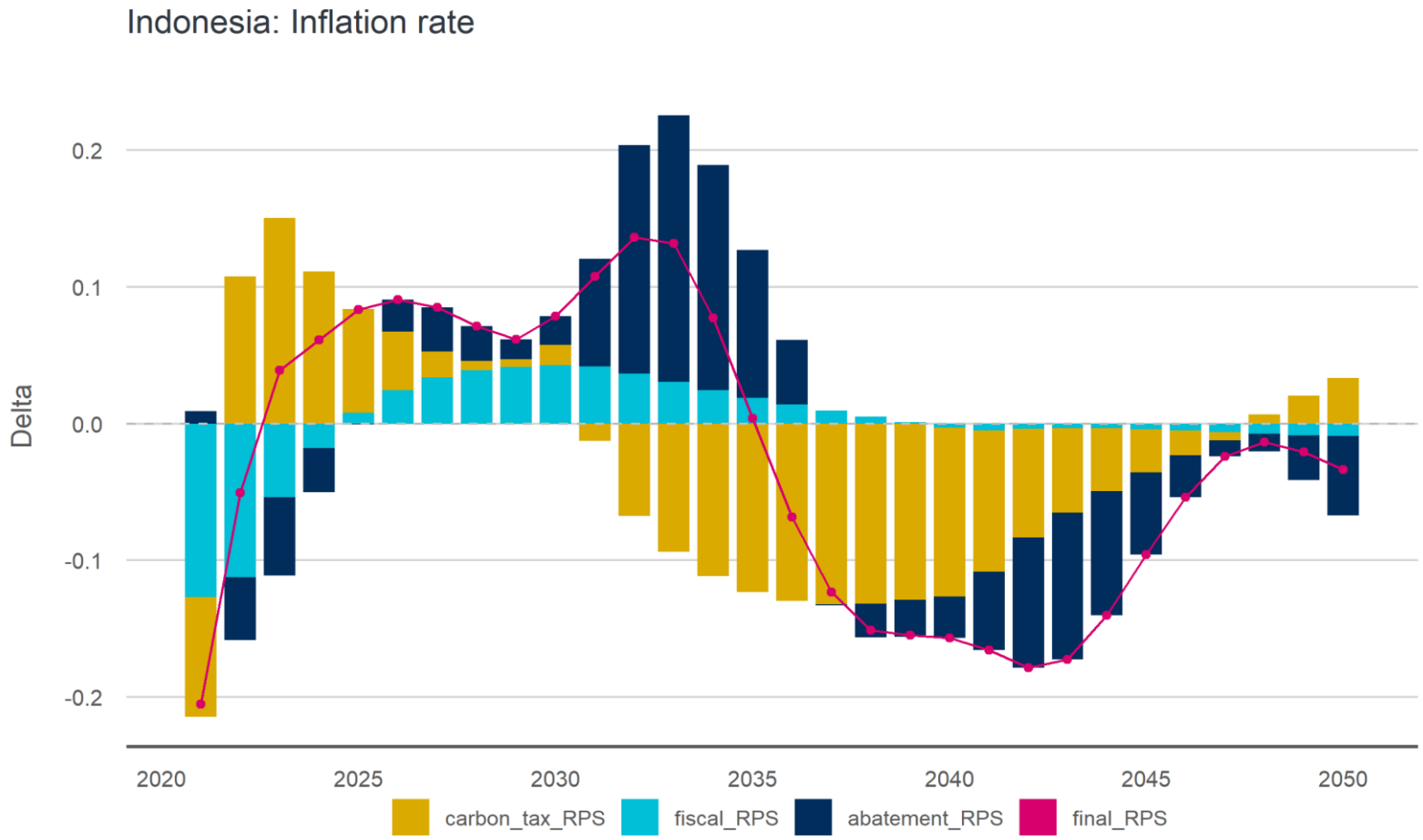
- Doesn’t provide a sectoral breakdown of the economy.
- Not all countries have a full economic structure. Reduce forms of the economy are used in these cases which could create volatility in the results.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix Inflation rate

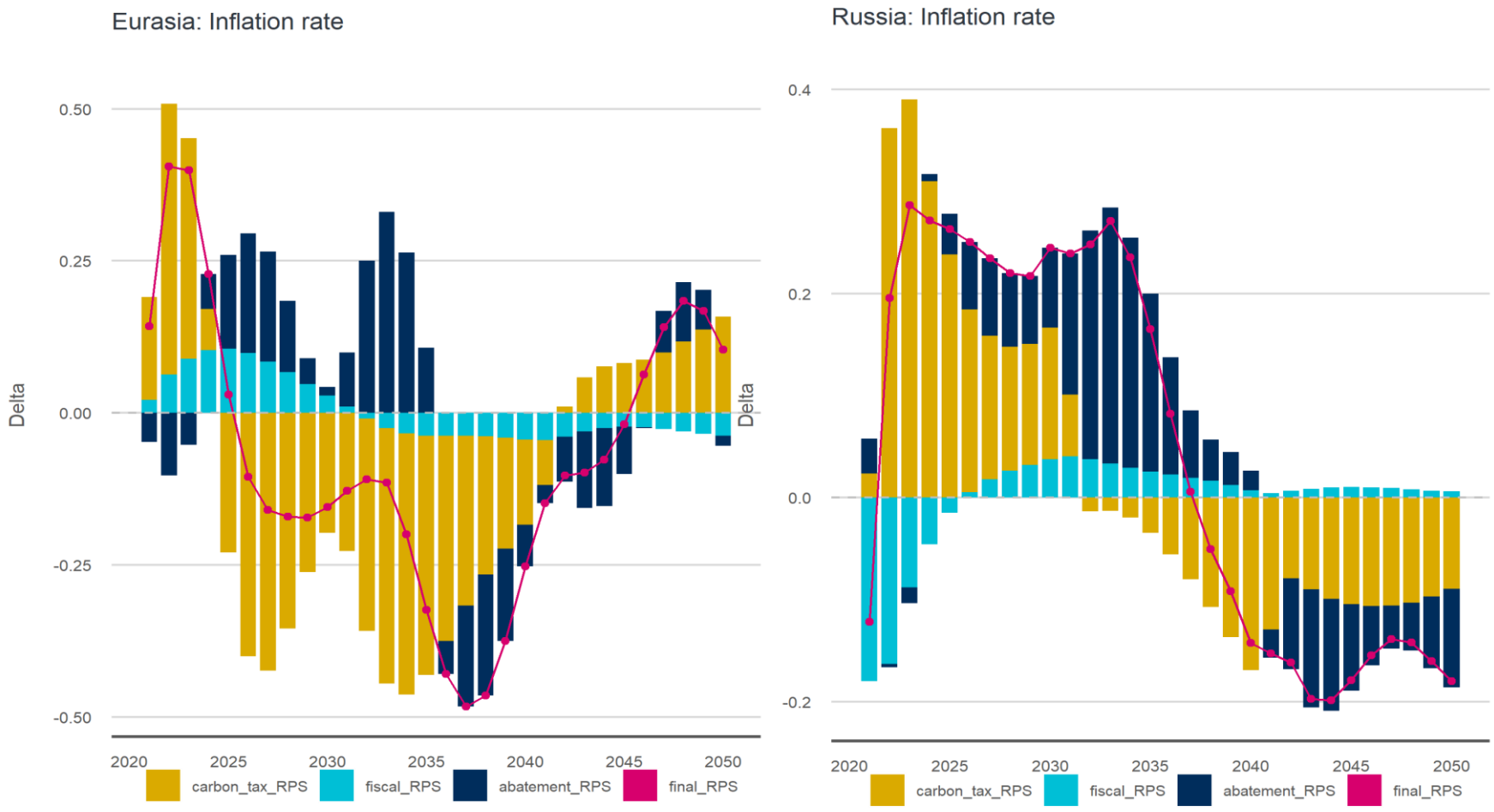
INEVITABLE POLICY RESPONSE

Inflation rate cumulative transitional impacts: Indonesia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

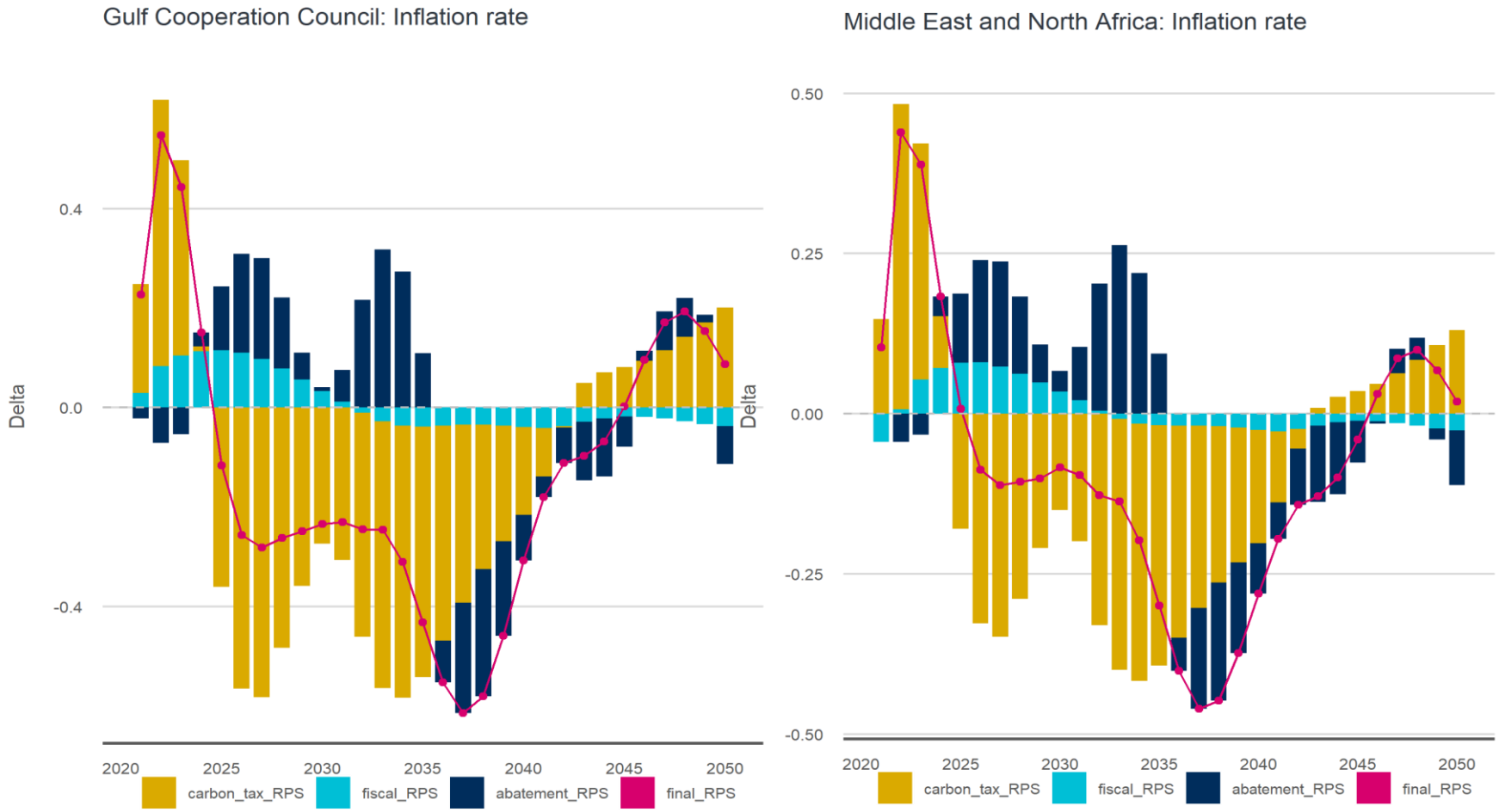
Inflation rate cumulative transitional impacts: Eurasia, Russia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

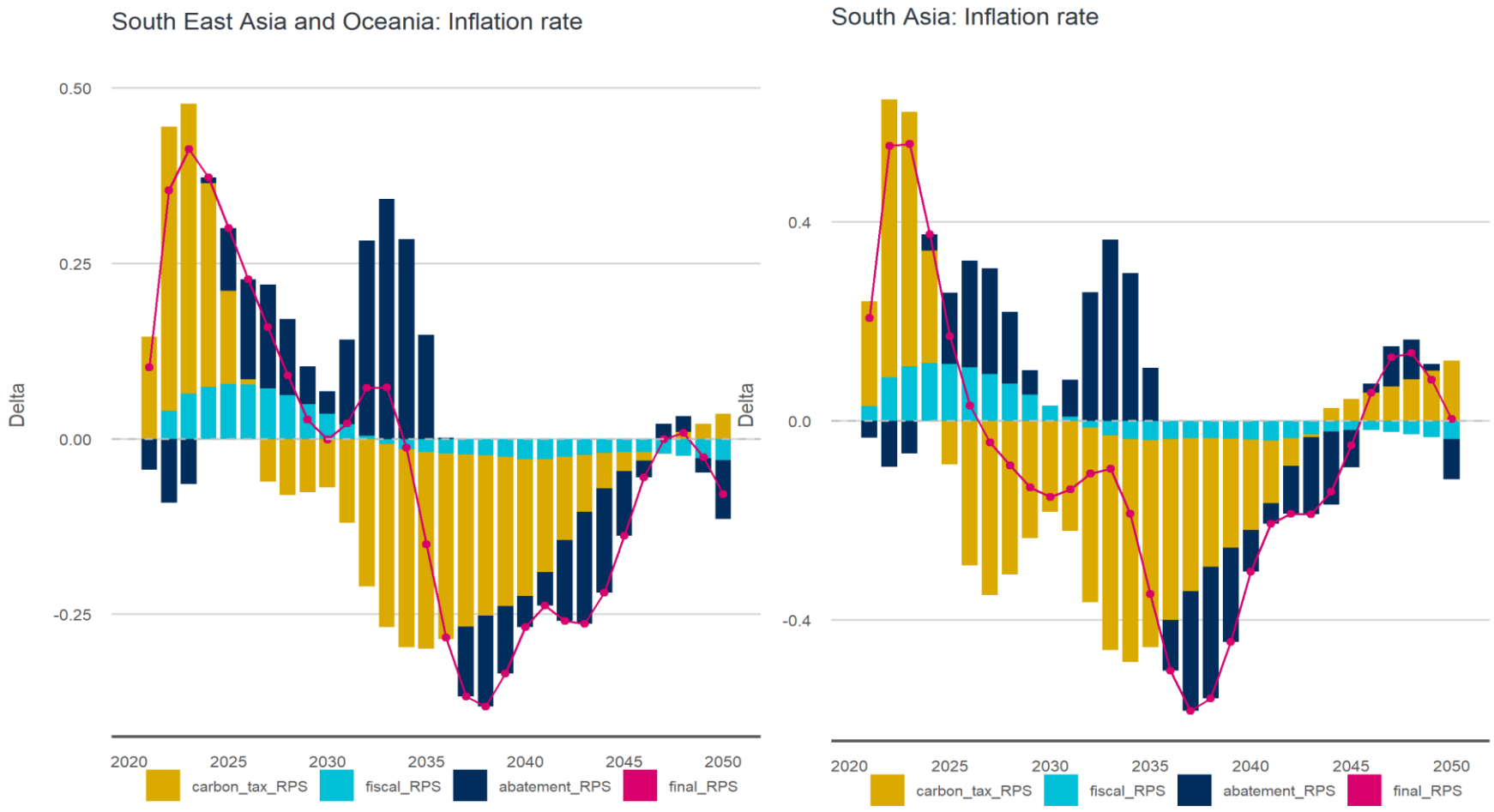
Inflation rate cumulative transitional impacts: Gulf CC, M. East and N. Africa



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

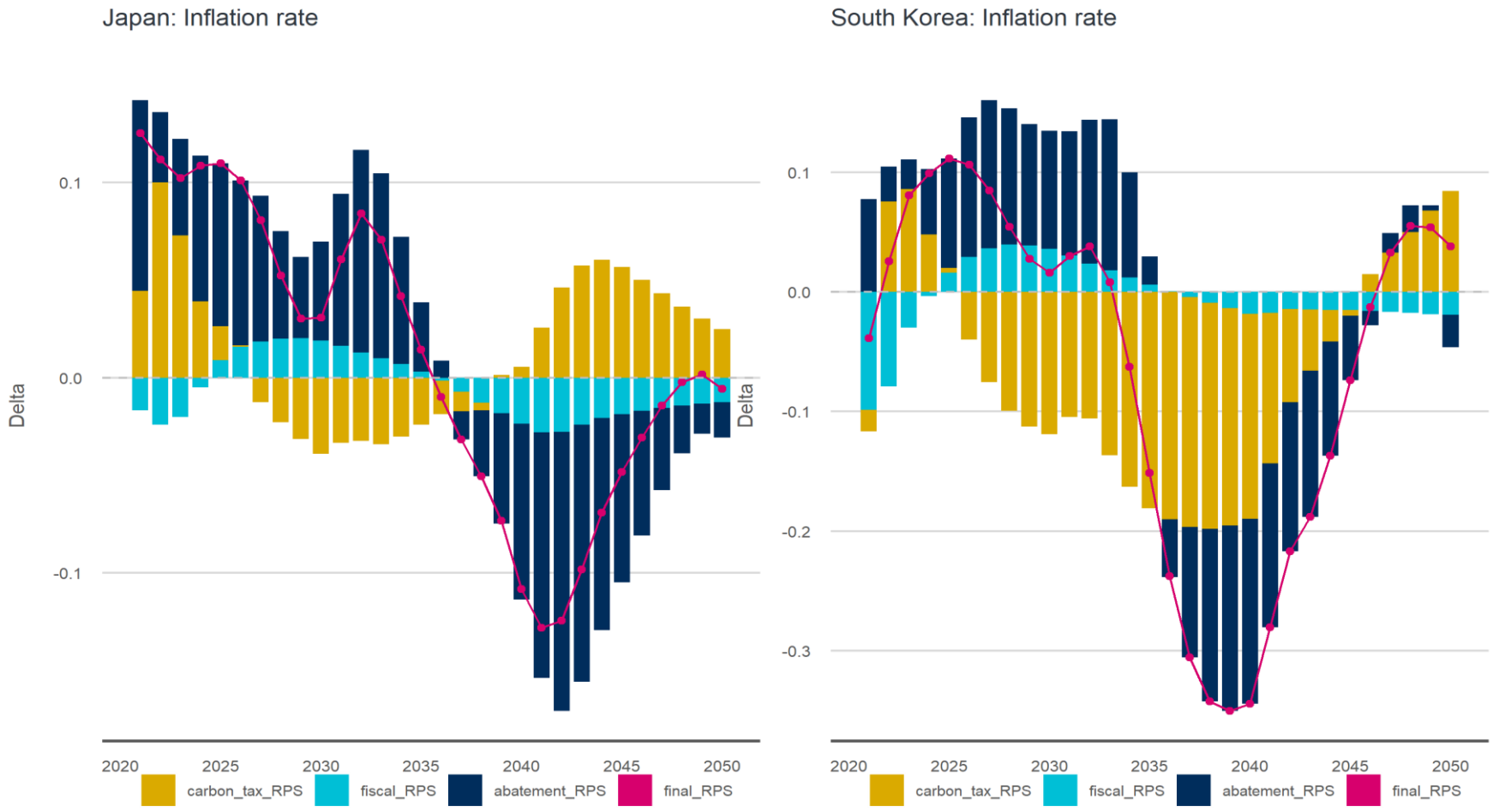
Inflation rate cumulative transitional impacts: South East Asia and Oceania, South Asia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

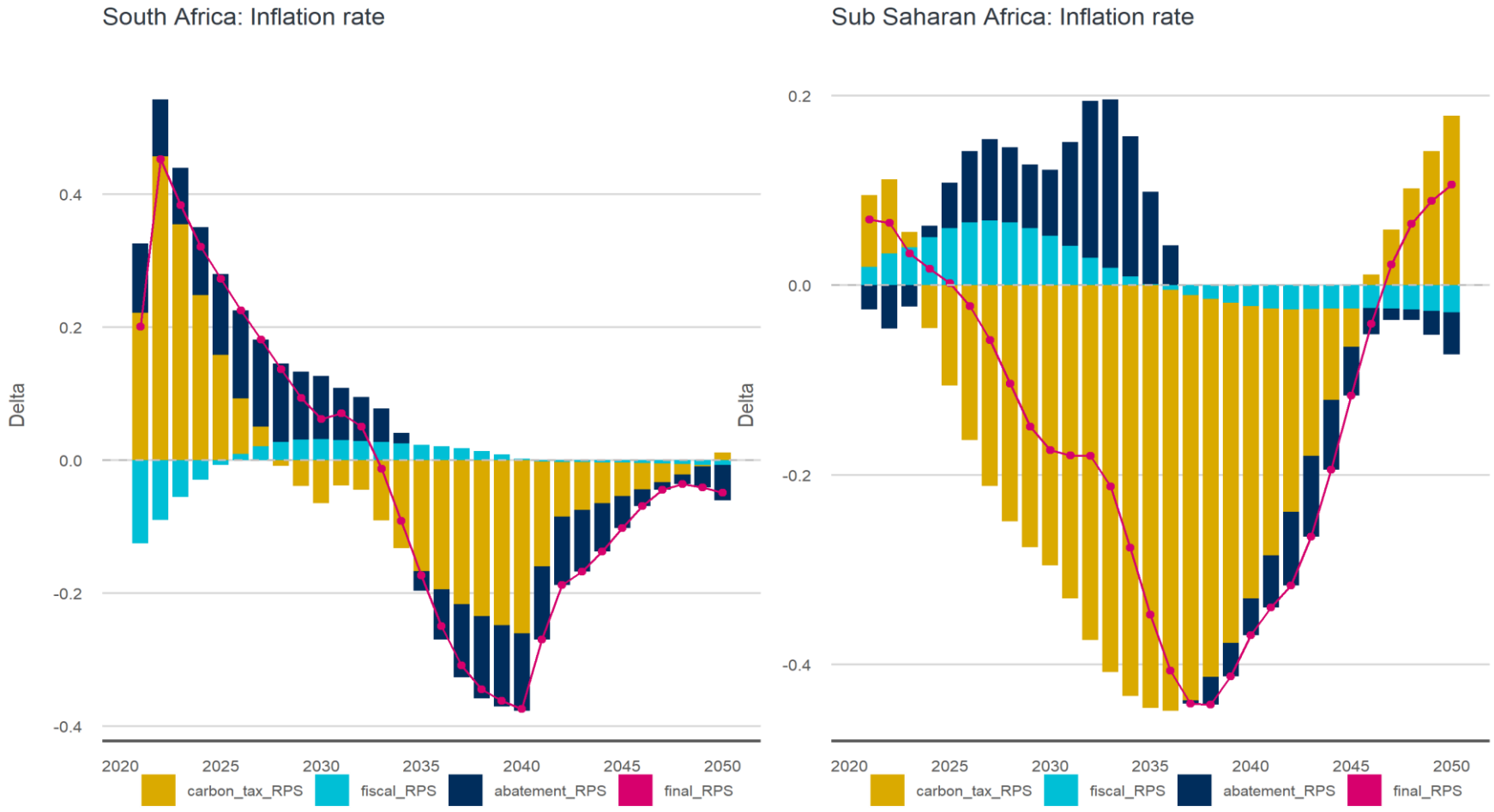
Inflation rate cumulative transitional impacts: Japan, South Korea



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Inflation rate cumulative transitional impacts: South Africa, Sub Saharan Africa



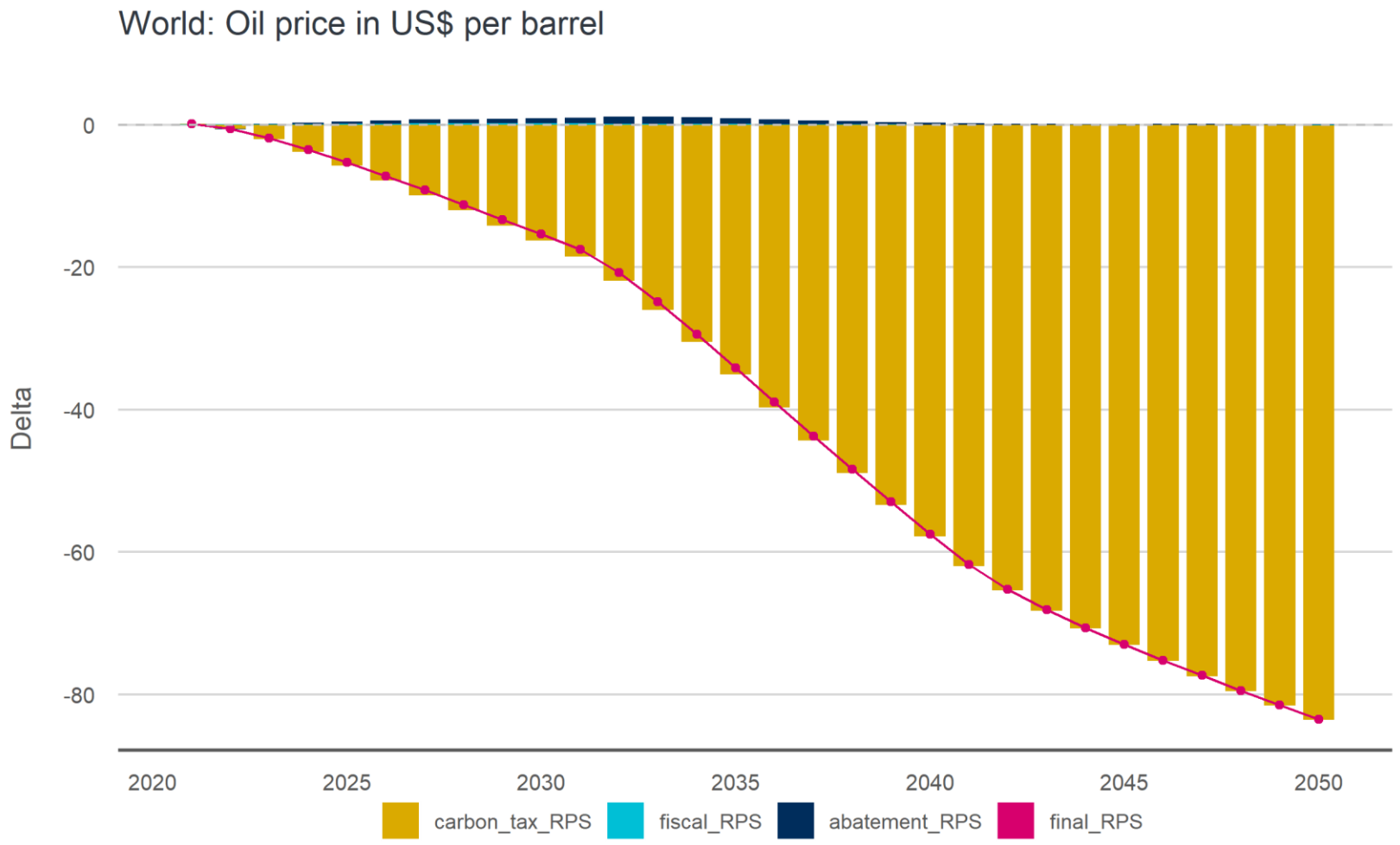
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Fossil fuel prices

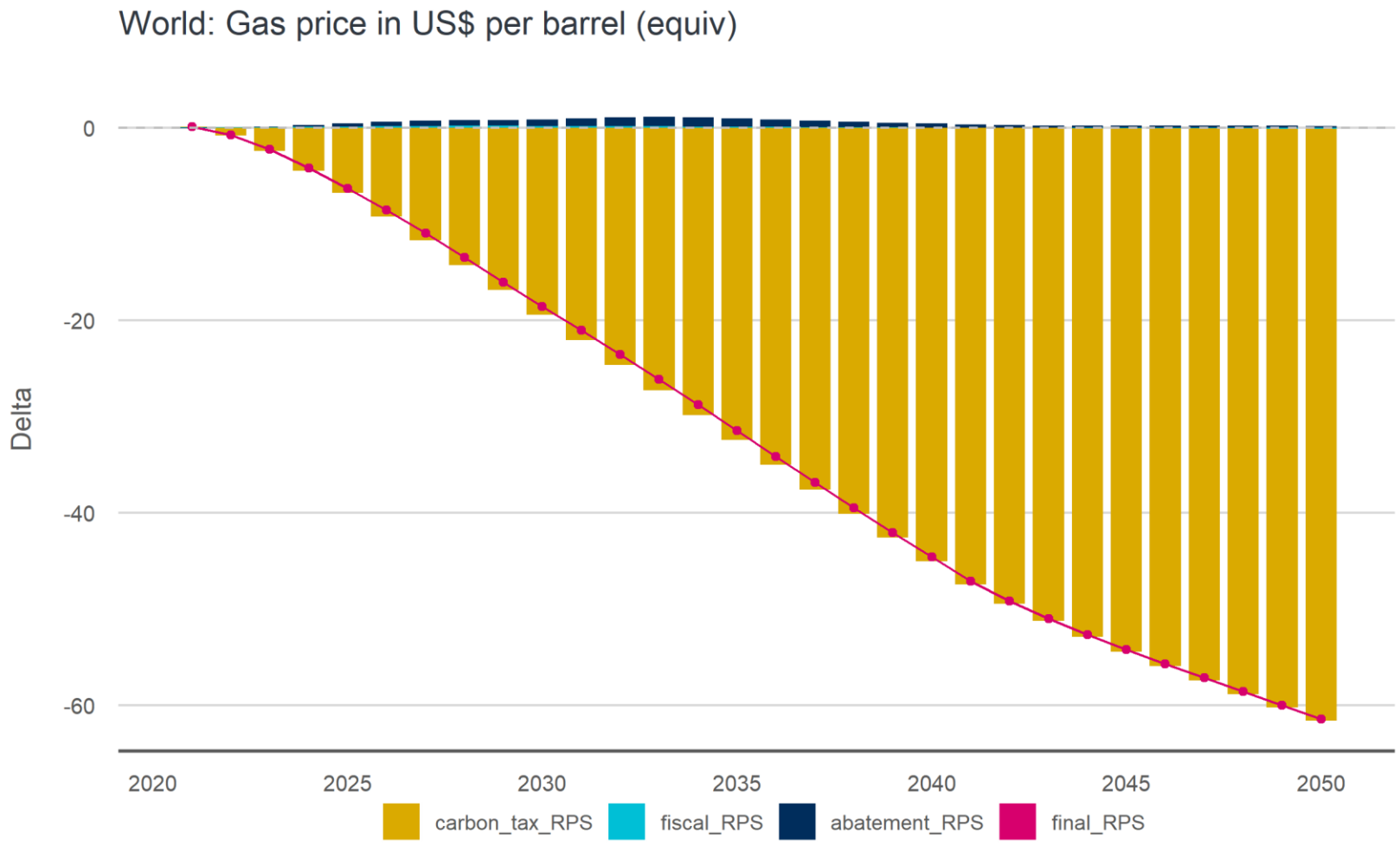
INEVITABLE POLICY RESPONSE

Oil price cumulative transitional impacts: Global



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

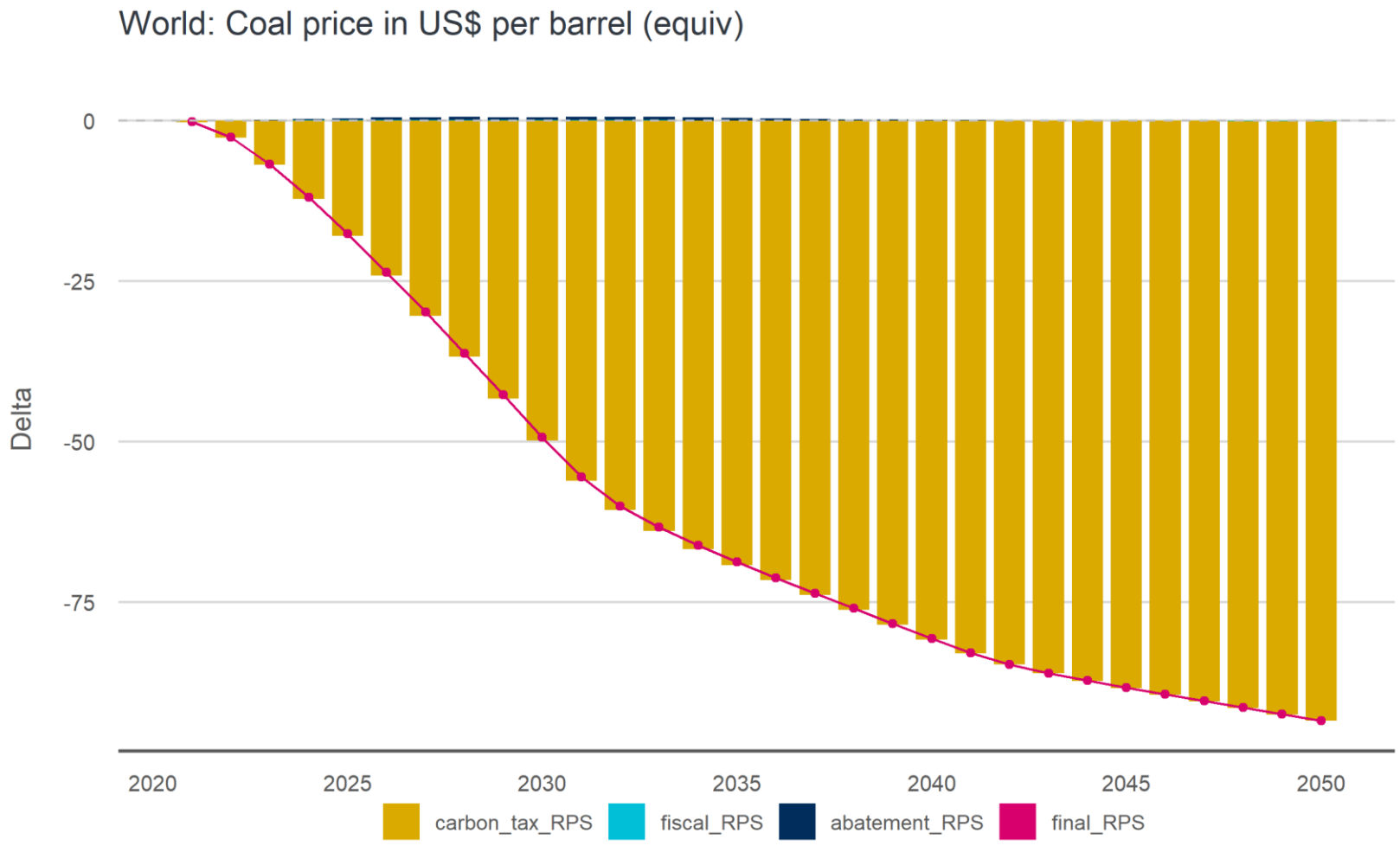
Gas price cumulative transitional impacts: Global



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Coal price cumulative transitional impacts: Global



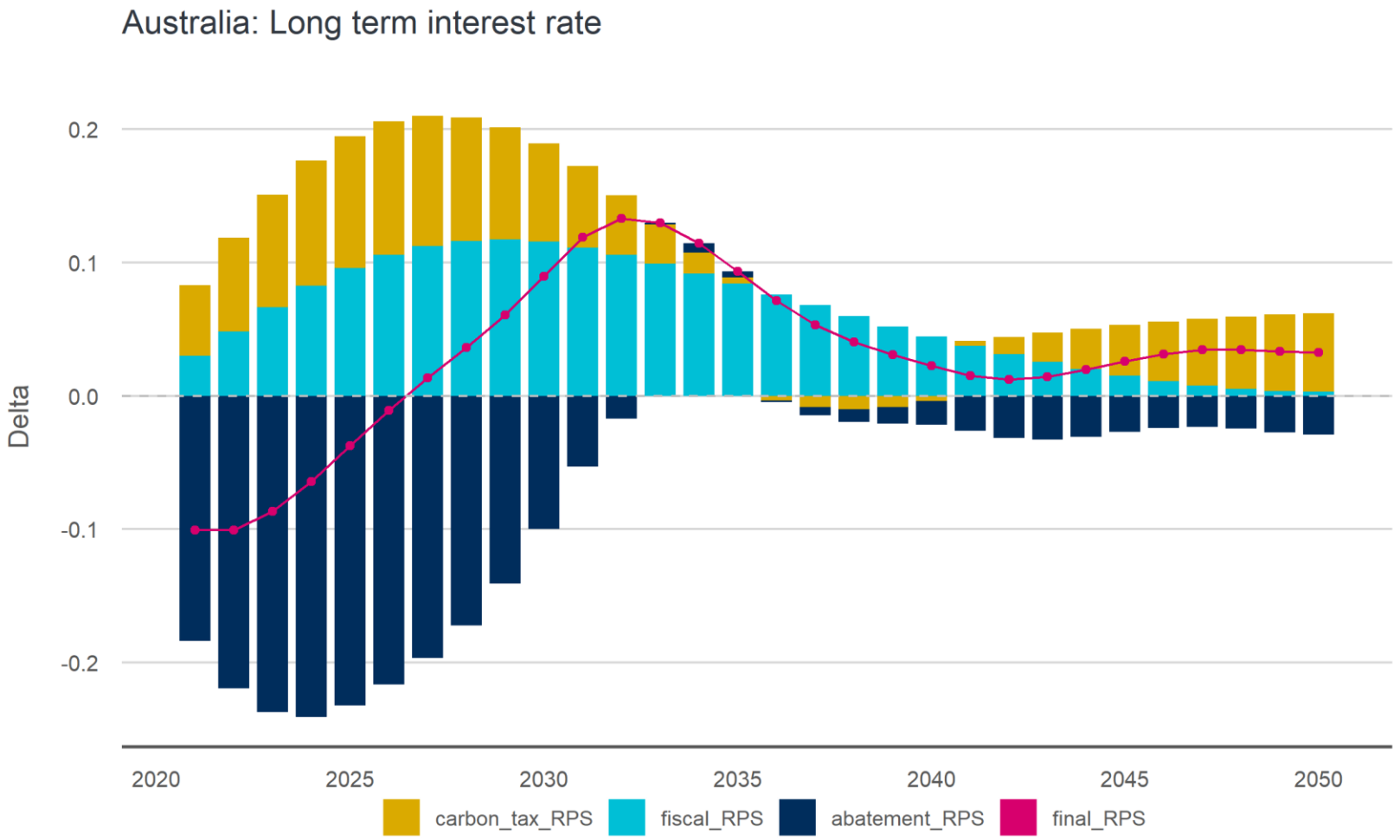
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Long term interest rates

INEVITABLE POLICY RESPONSE

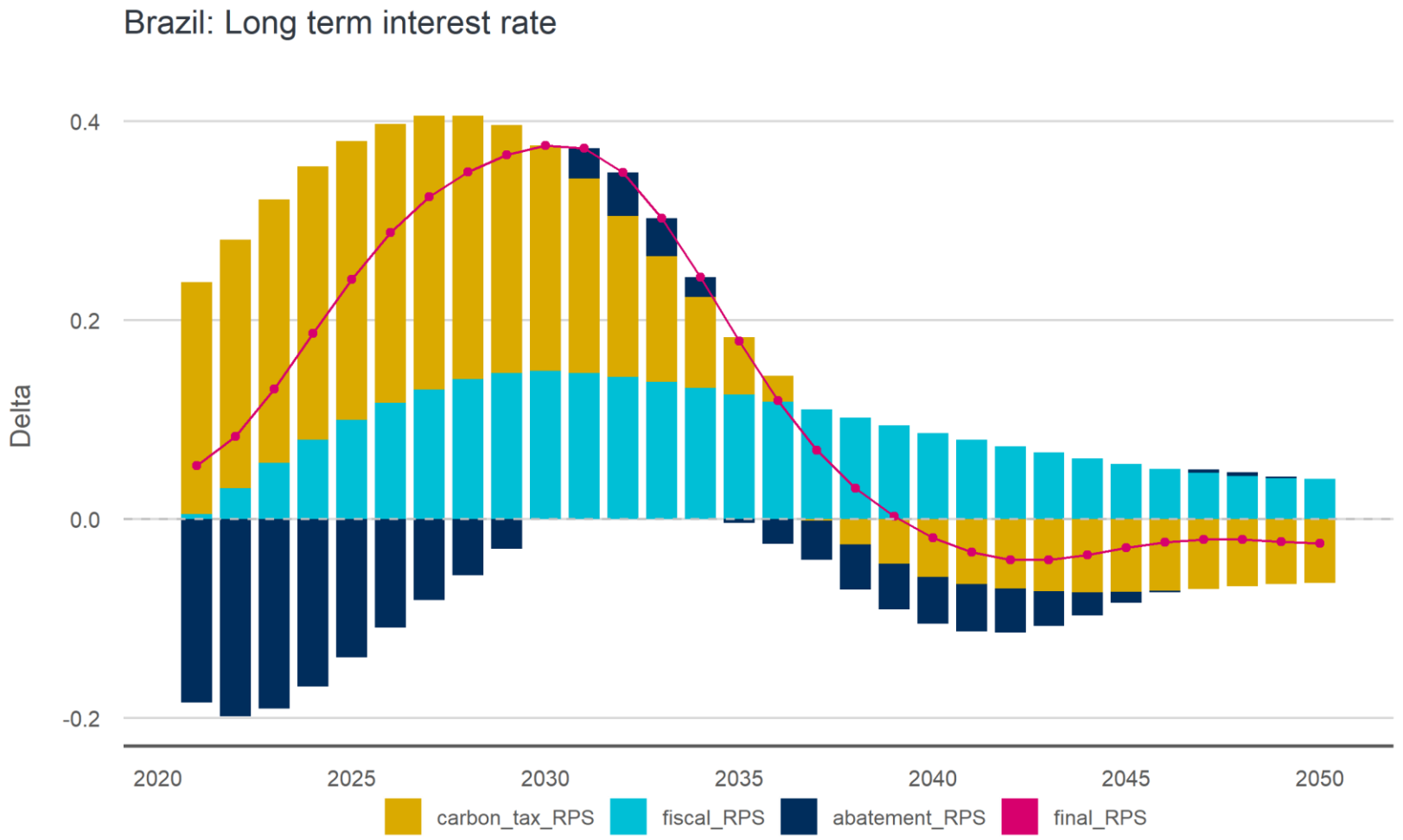
Long term interest rate cumulative transitional impacts: Australia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

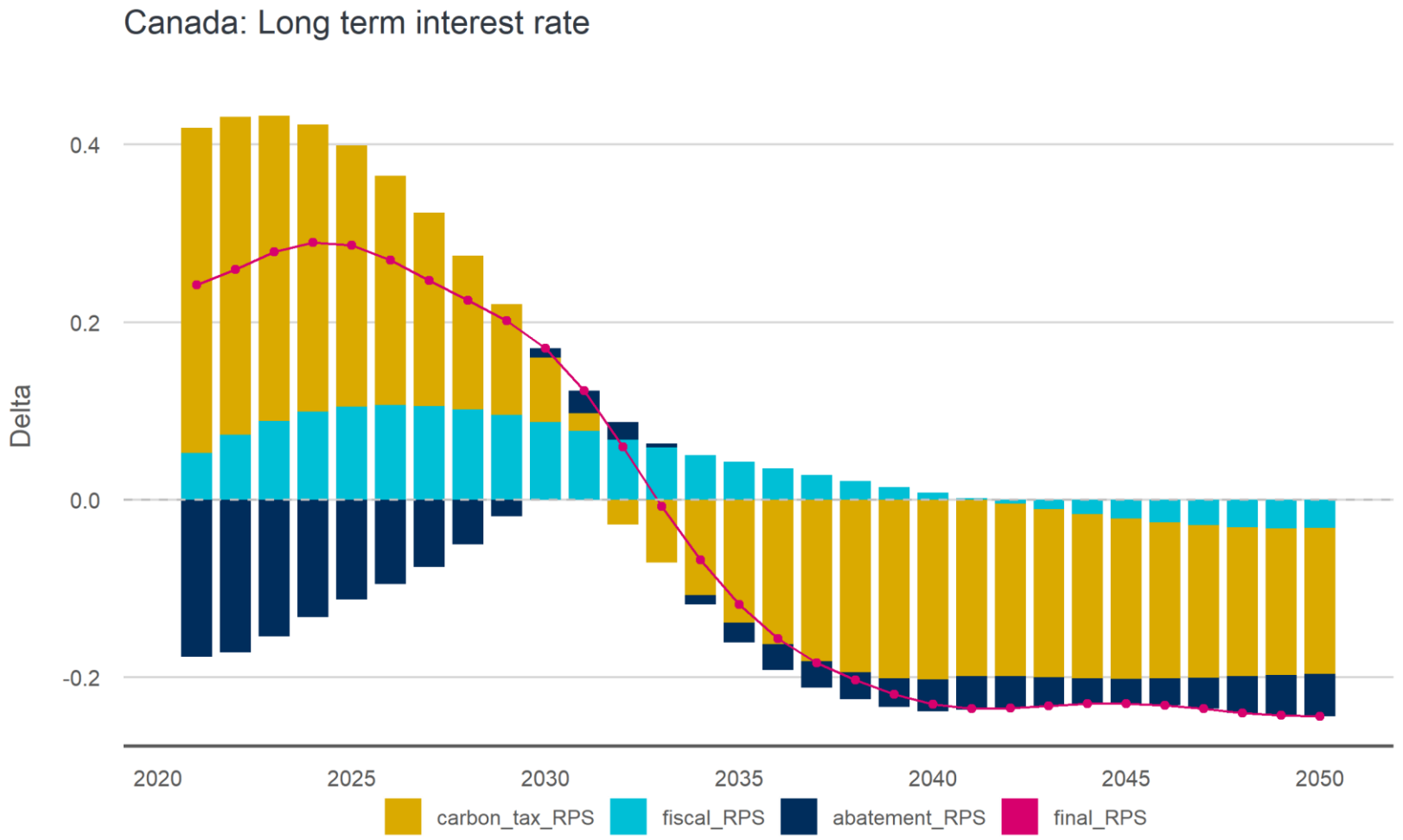
Long term interest rate cumulative transitional impacts: Brazil



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

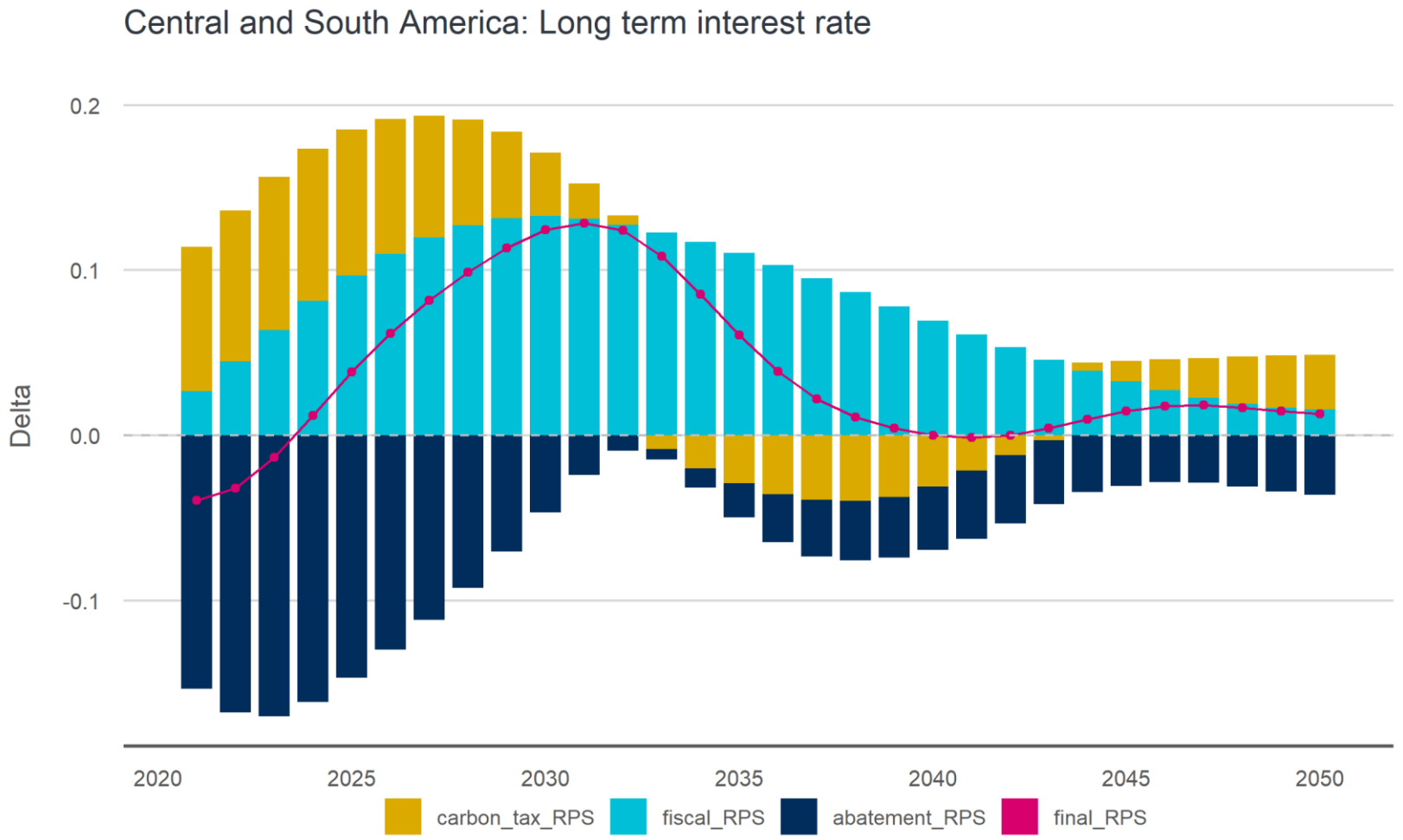
Long term interest rate cumulative transitional impacts: Canada



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

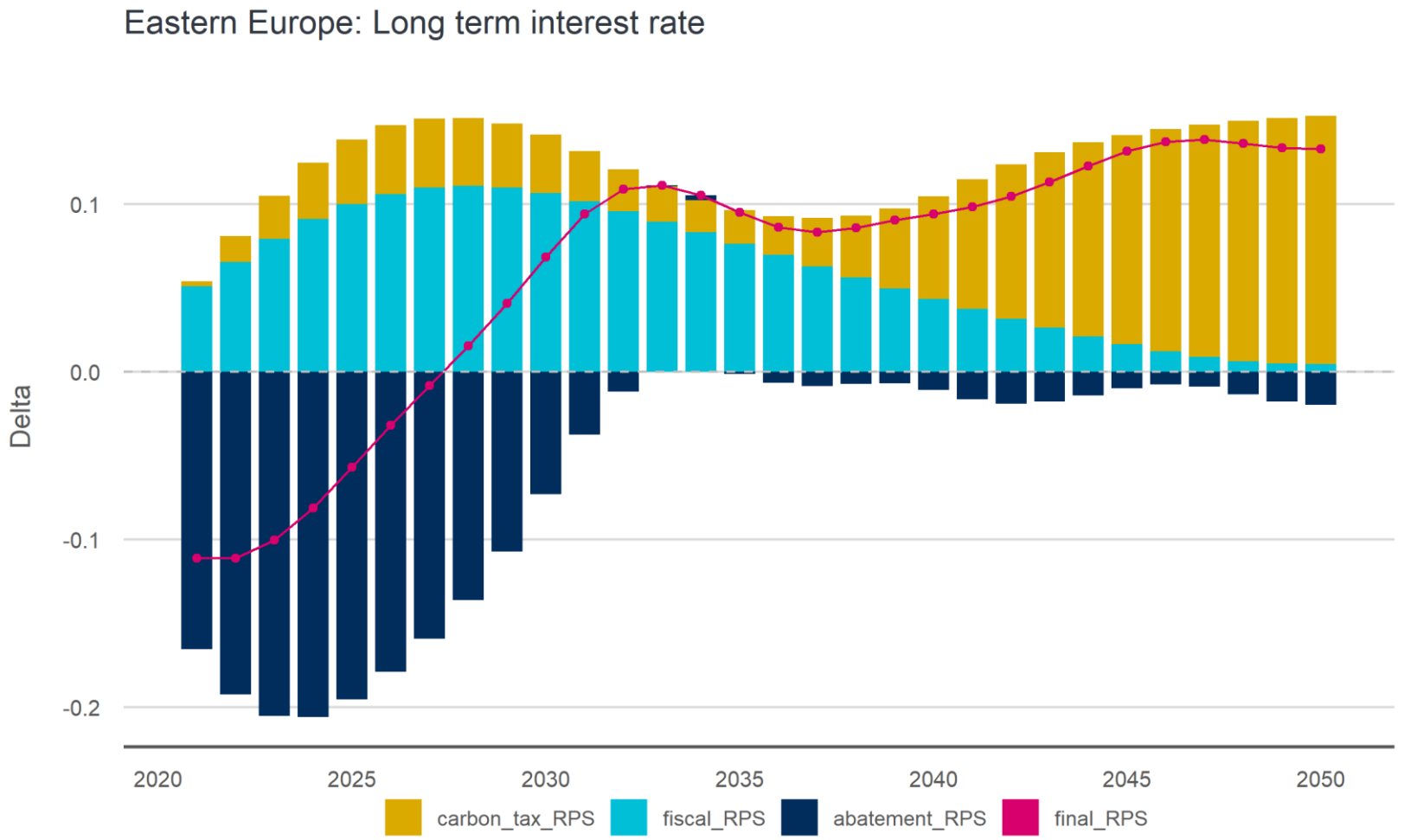
Long term interest rate cumulative transitional impacts: Central and South America



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

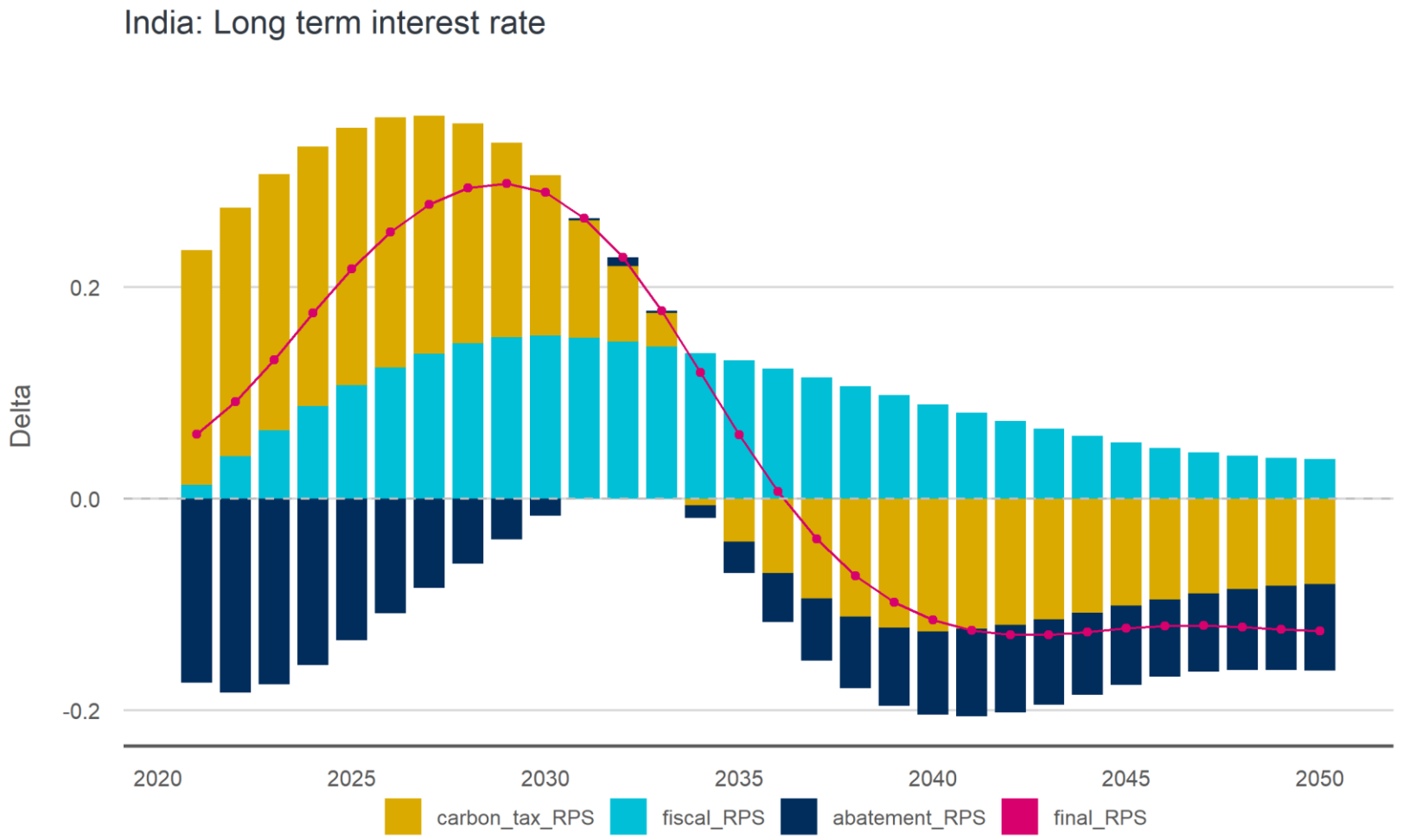
Long term interest rate cumulative transitional impacts: Eastern Europe



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

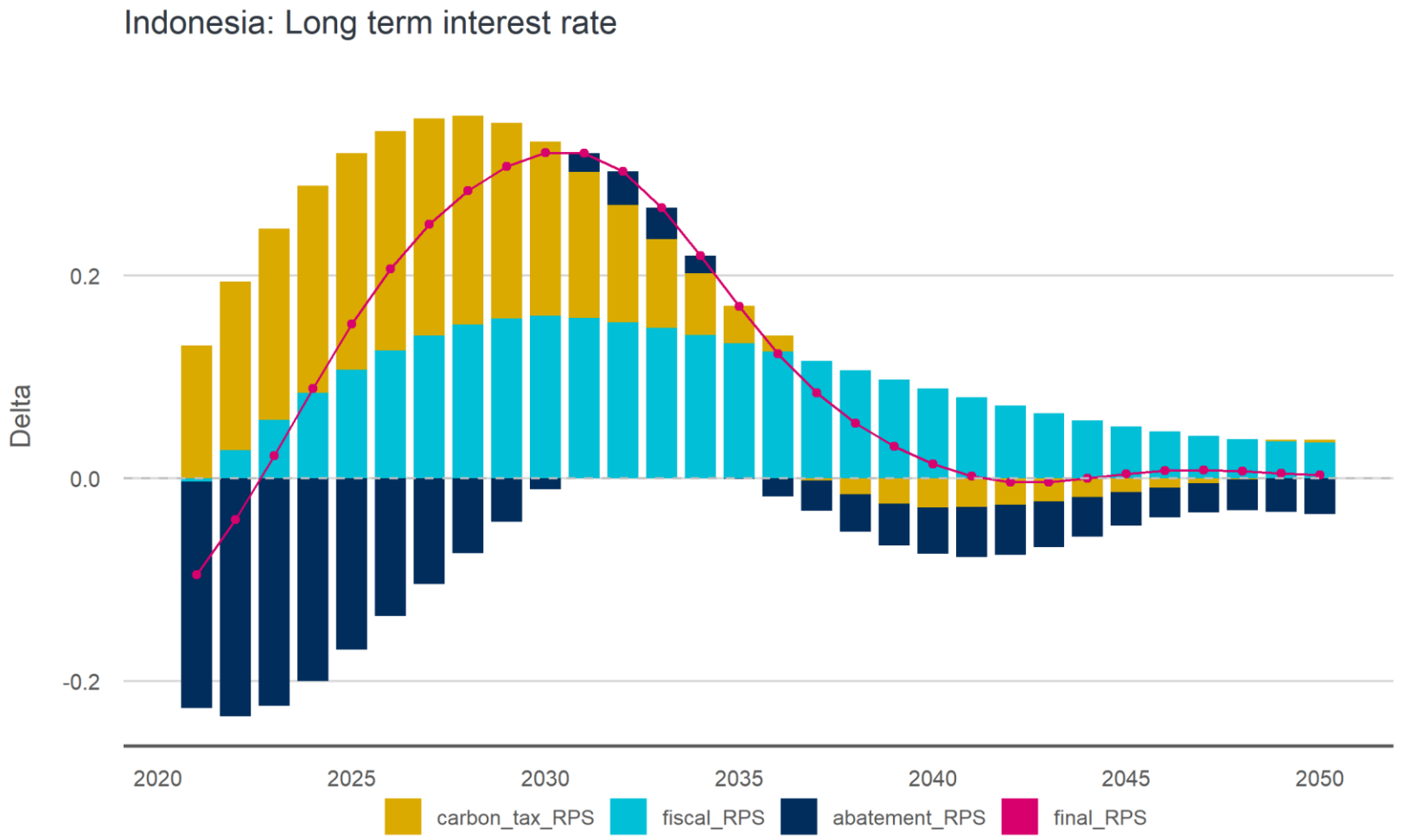
Long term interest rate cumulative transitional impacts: India



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

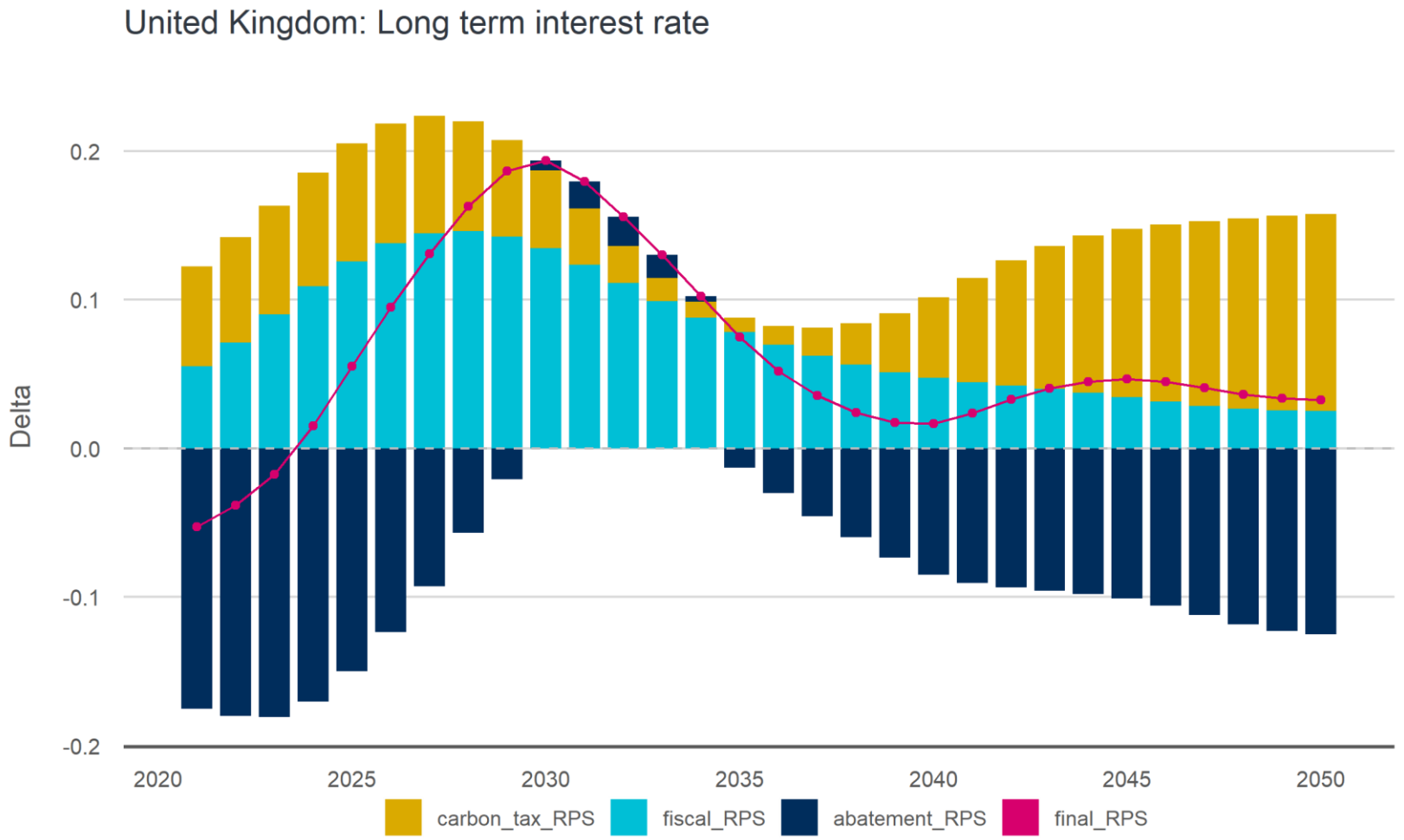
Long term interest rate cumulative transitional impacts: Indonesia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

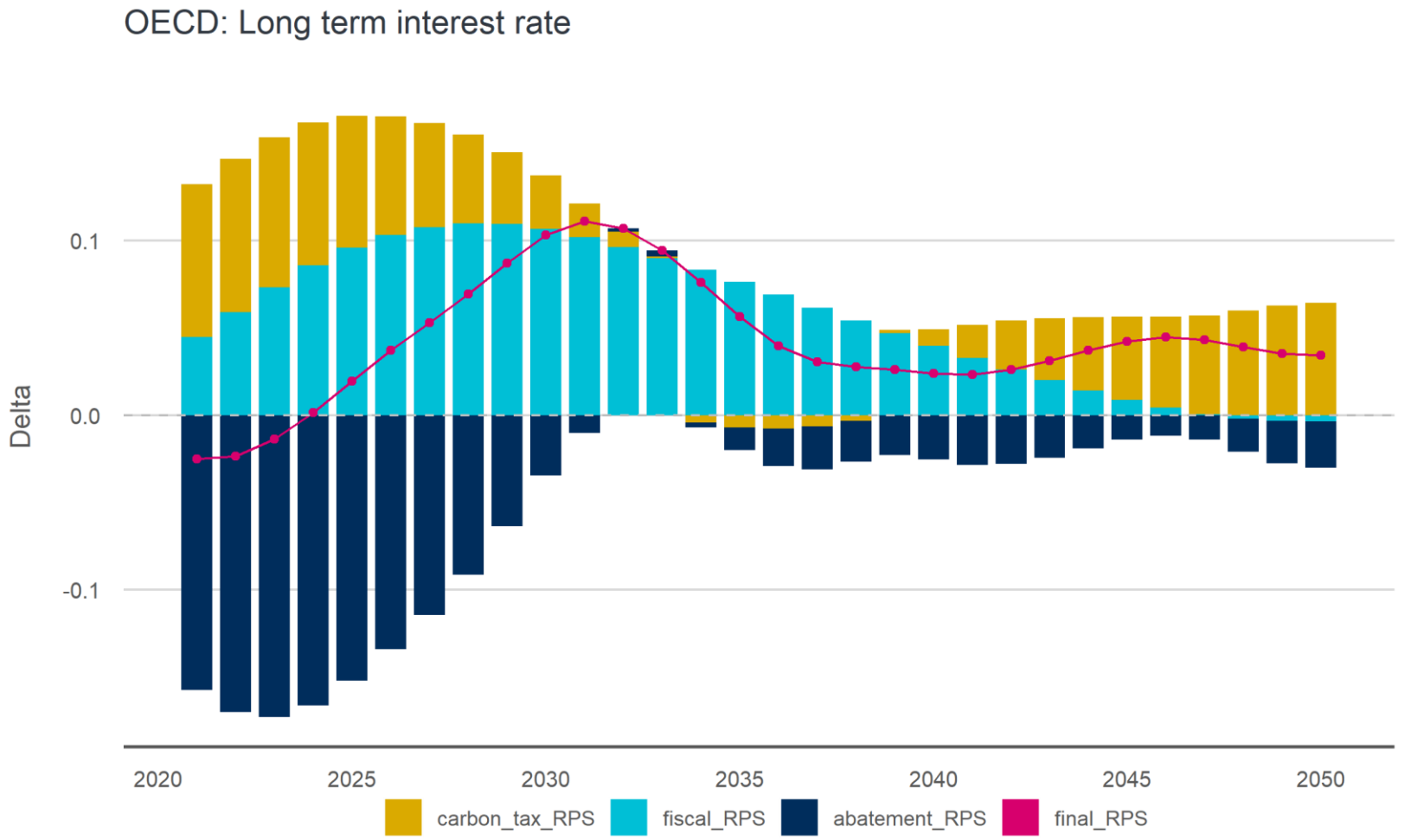
Long term interest rate cumulative transitional impacts: United Kingdom



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

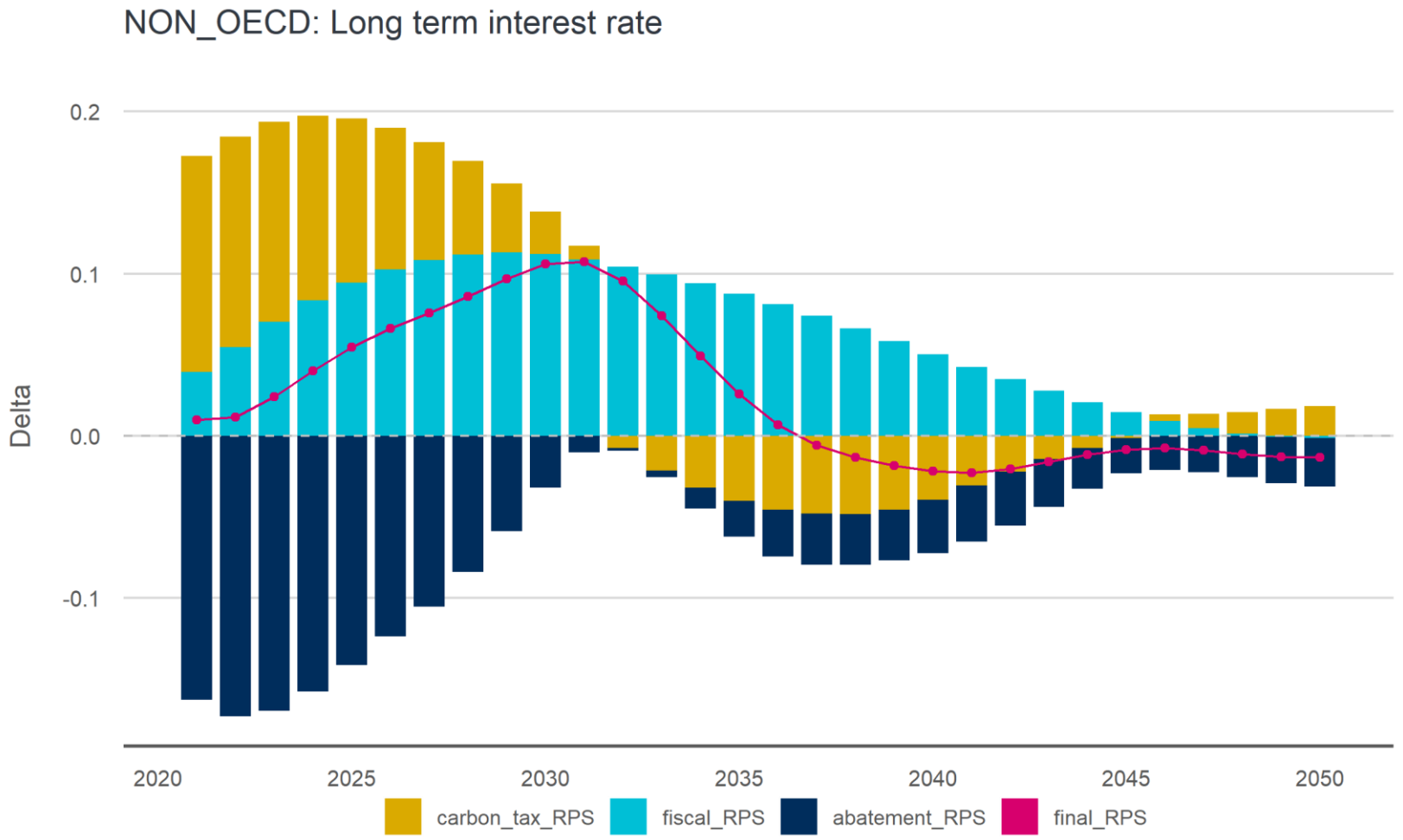
Long term interest rate cumulative transitional impacts: OECD



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

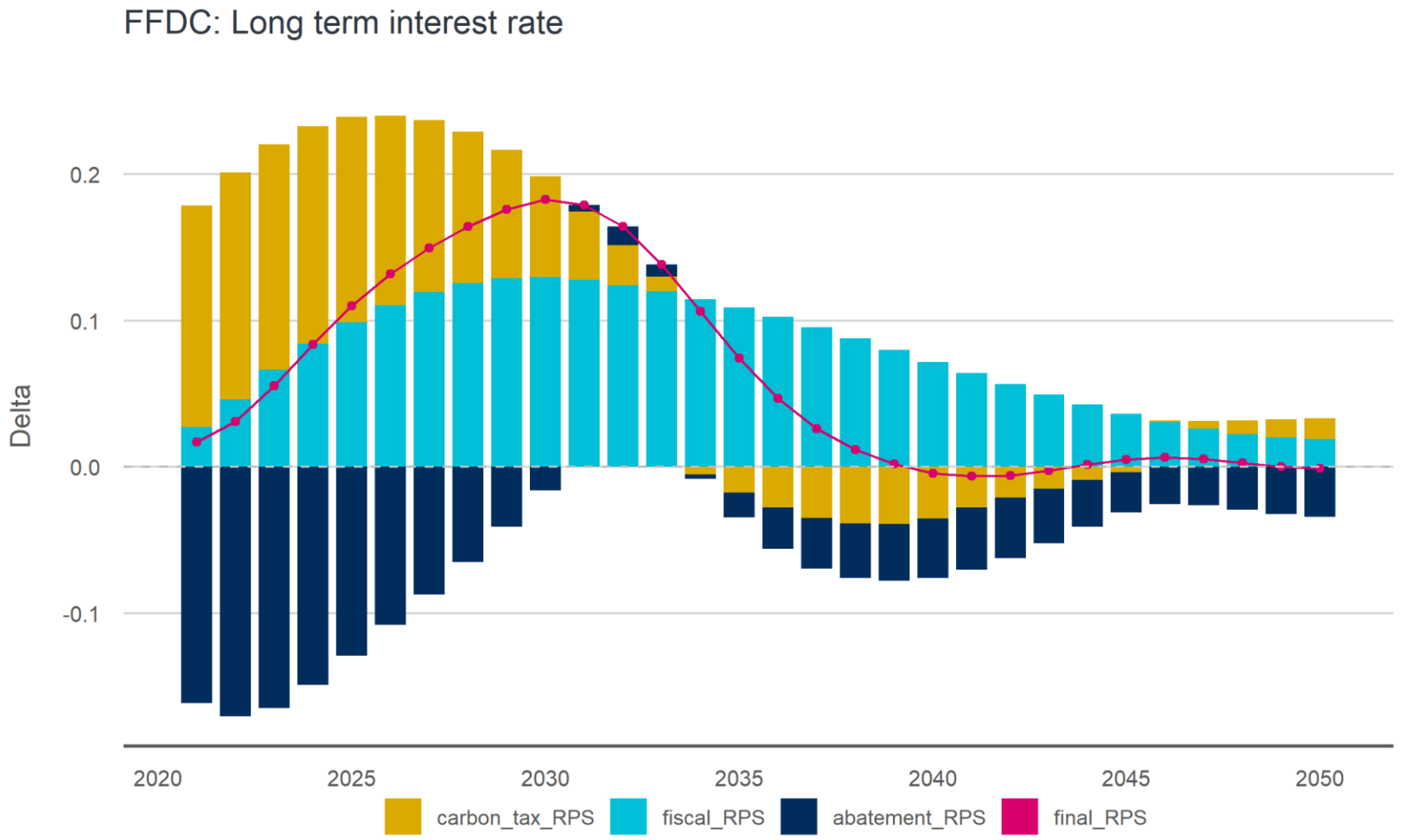
Long term interest rate cumulative transitional impacts: Non-OECD



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

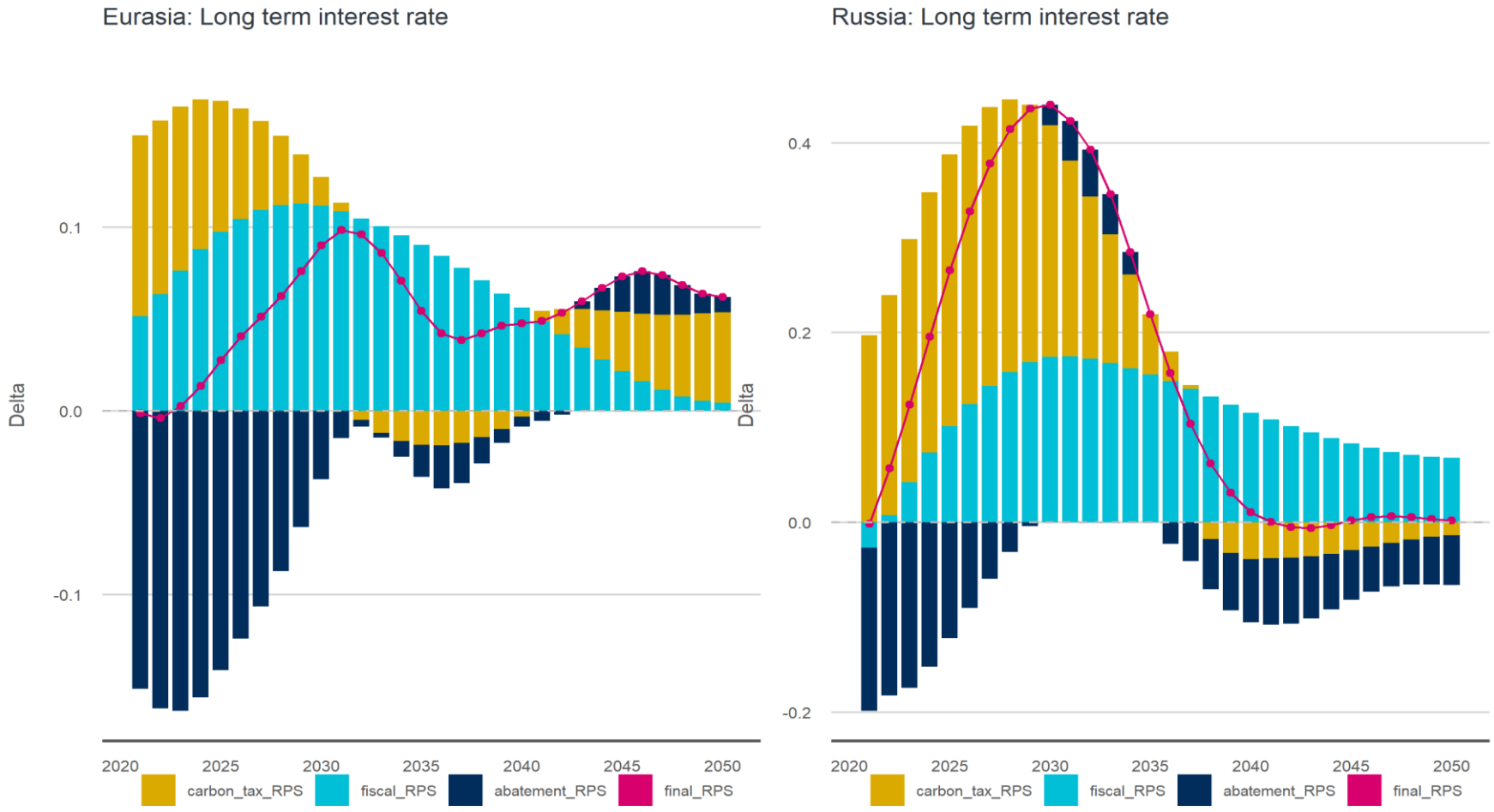
Long term interest rate cumulative transitional impacts: FFDC



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

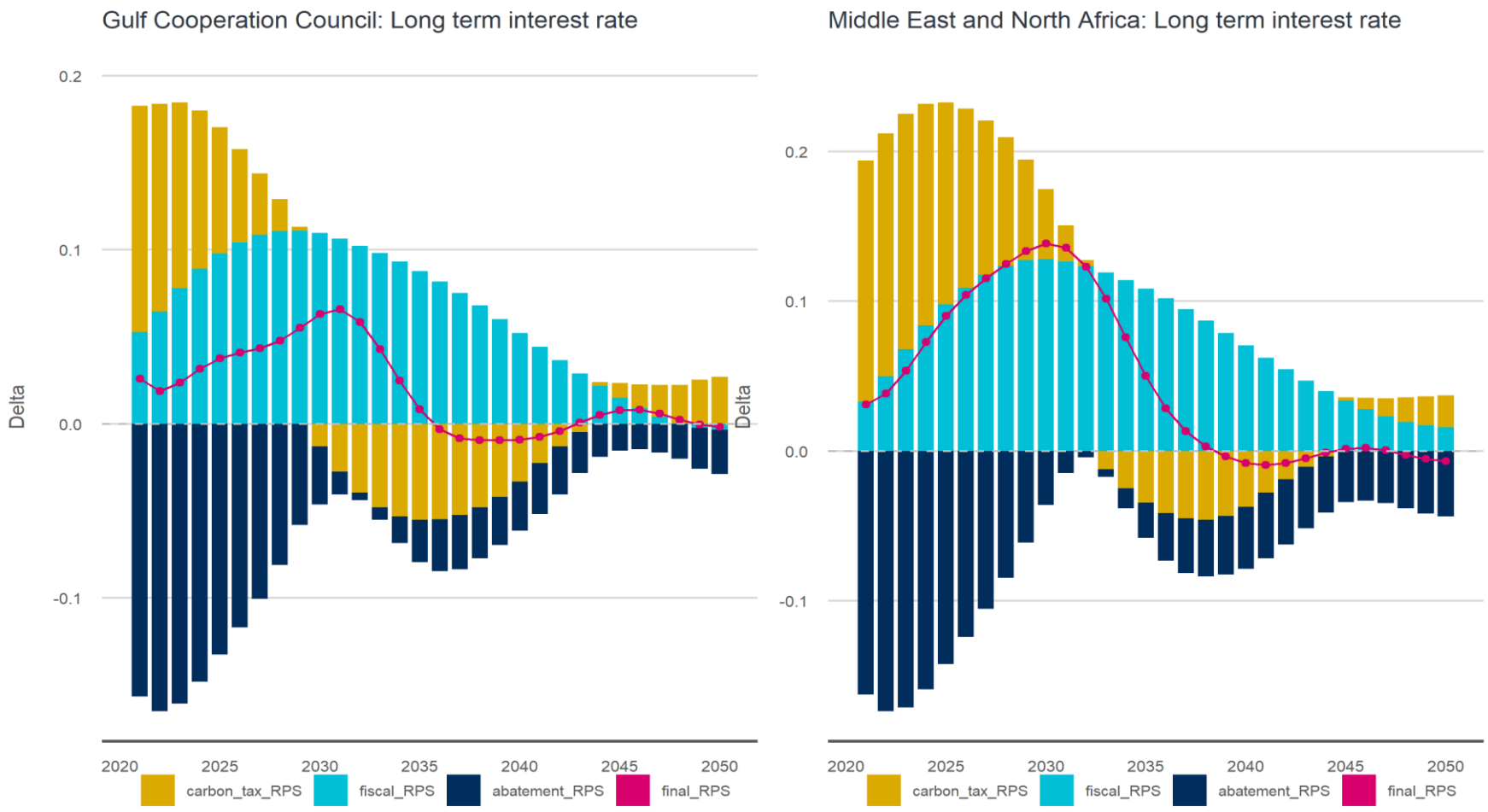
Long term interest rate cumulative transitional impacts: Eurasia, Russia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

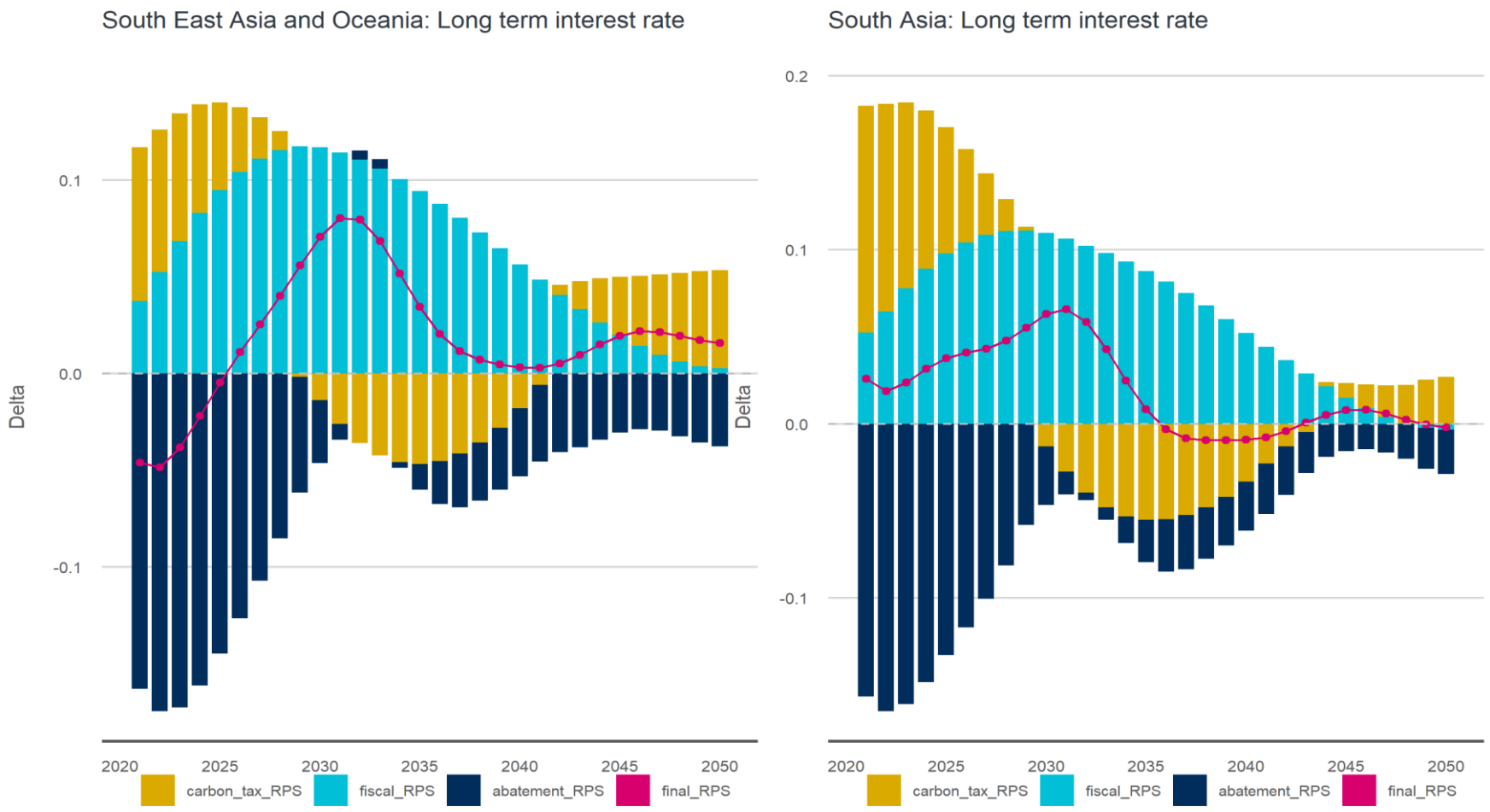
Long term interest rate cumulative transitional impacts: Gulf CC., Middle E. and N. Africa



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

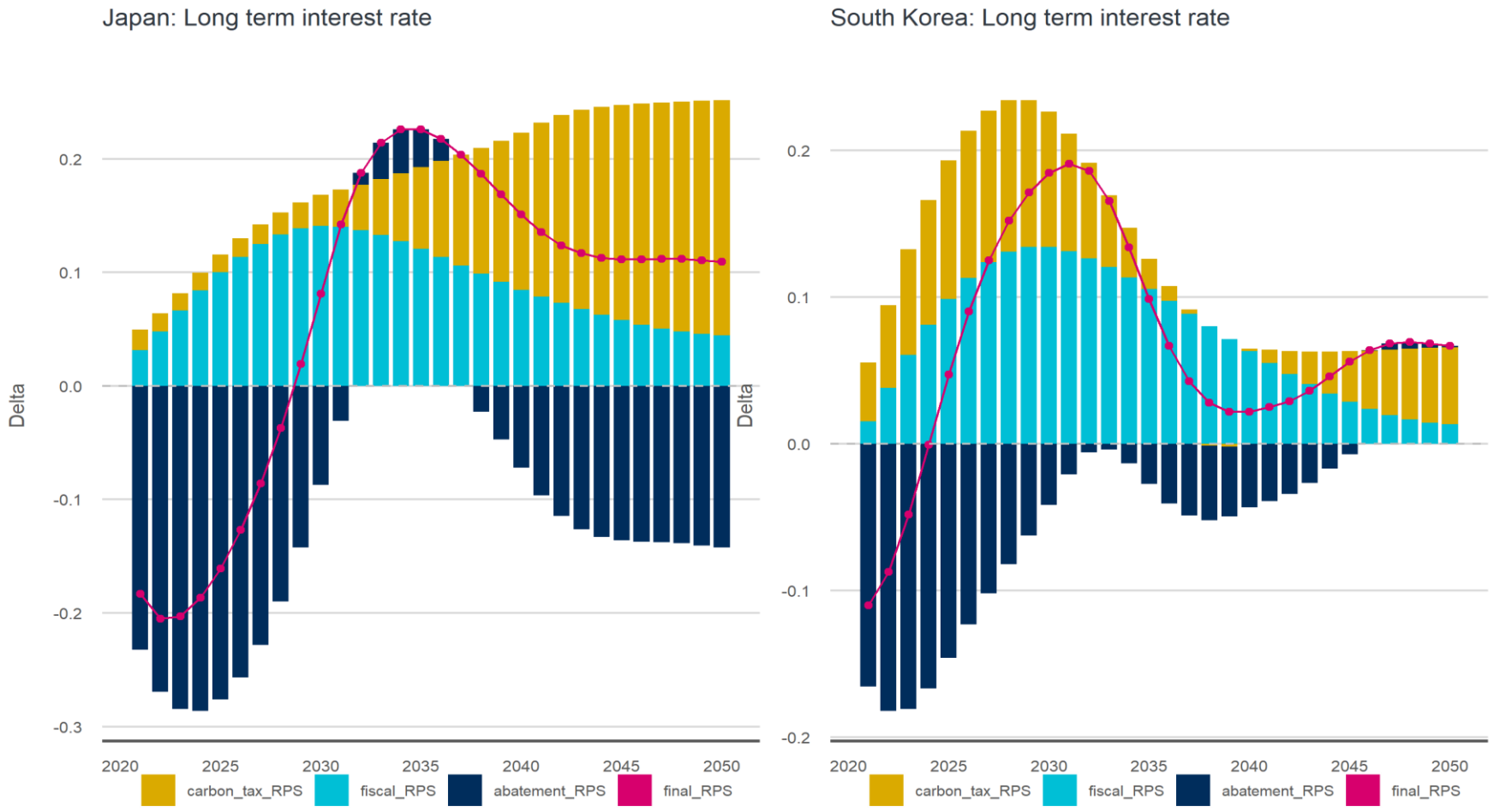
Long term interest rate cumulative transitional impacts: S.E. Asia and Oceania, S. Asia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

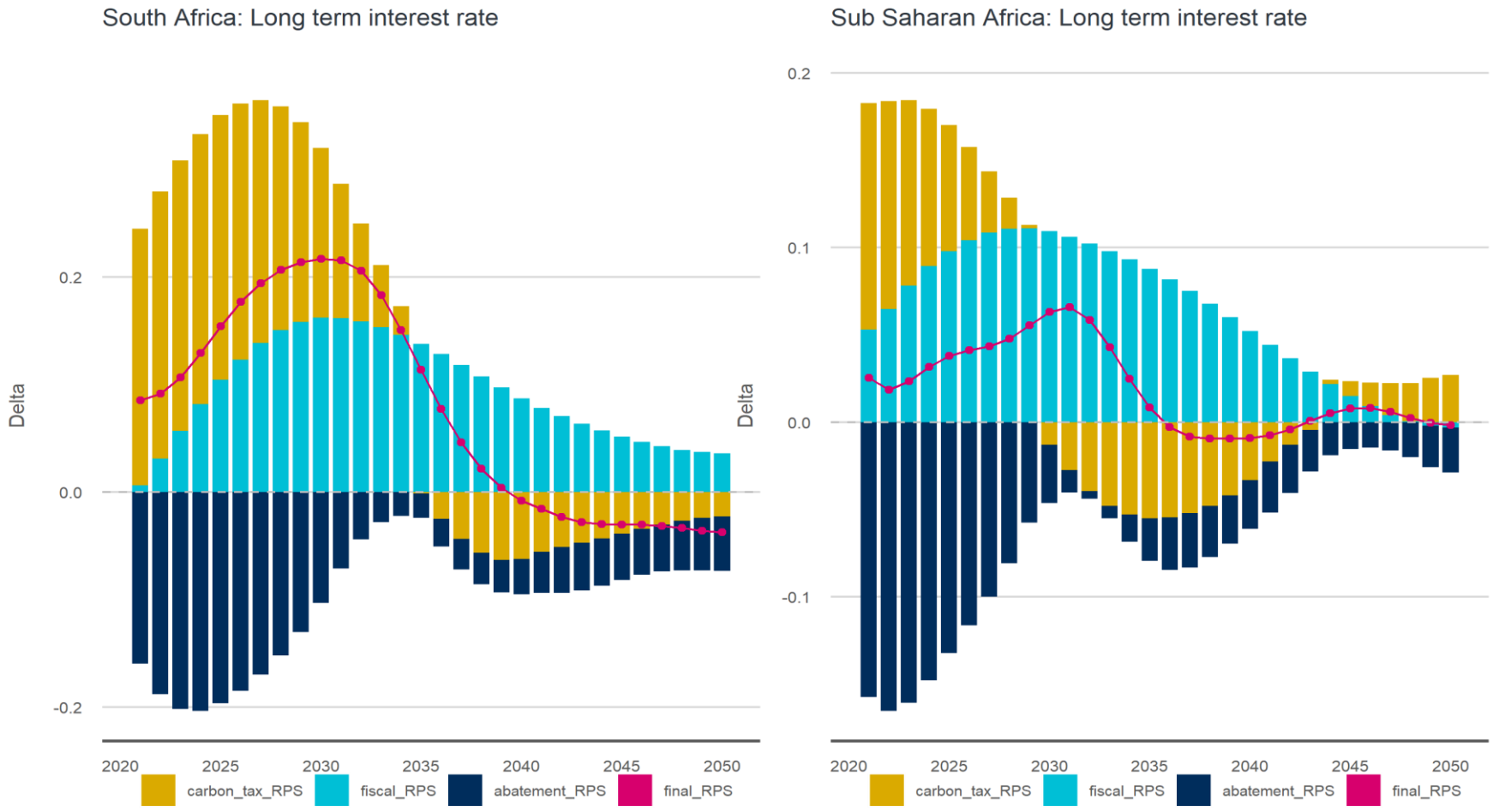
Long term interest rate cumulative transitional impacts: Japan, South Korea



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Long term interest rate cumulative transitional impacts: South Africa, Sub Saharan Africa



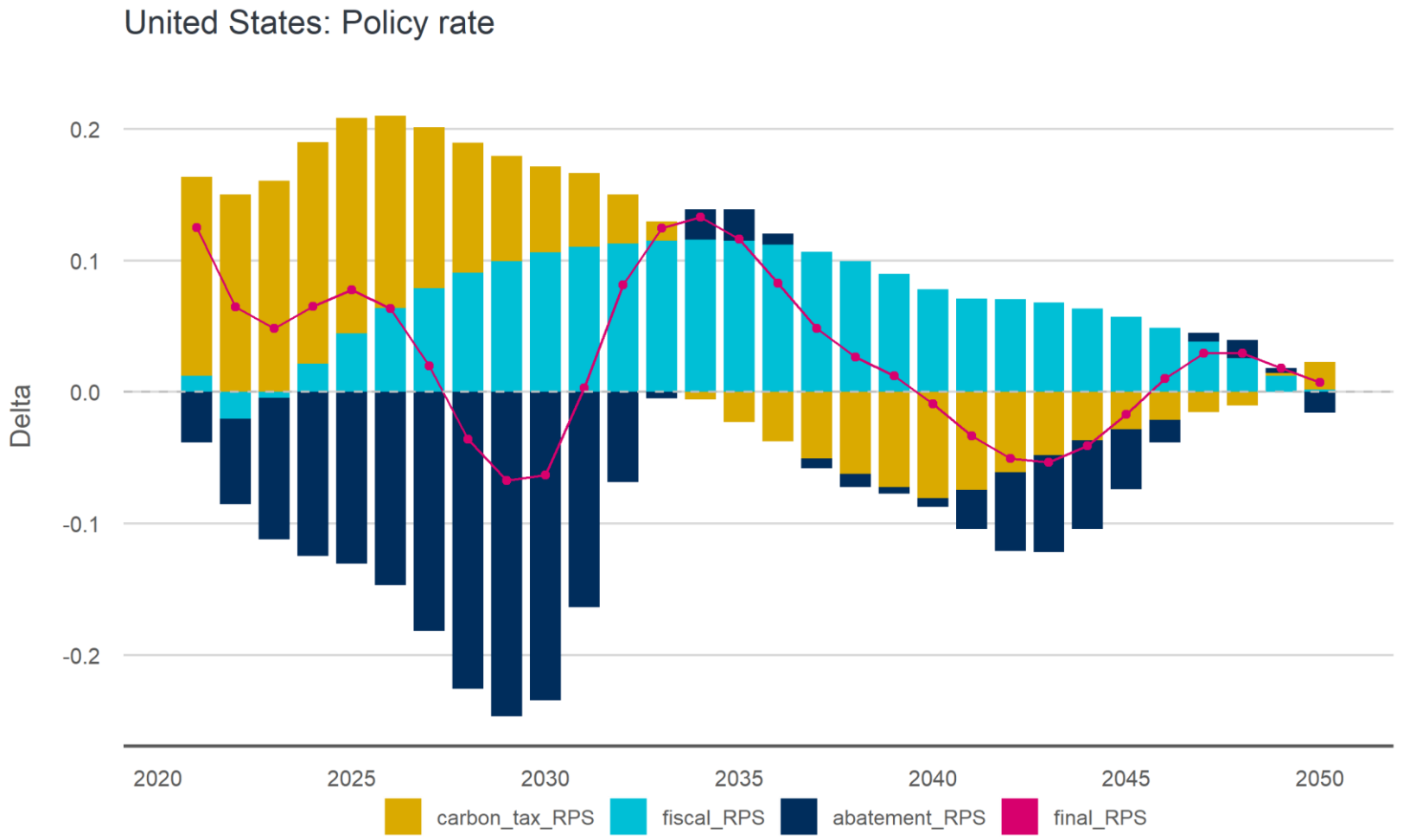
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Policy rates

INEVITABLE POLICY RESPONSE

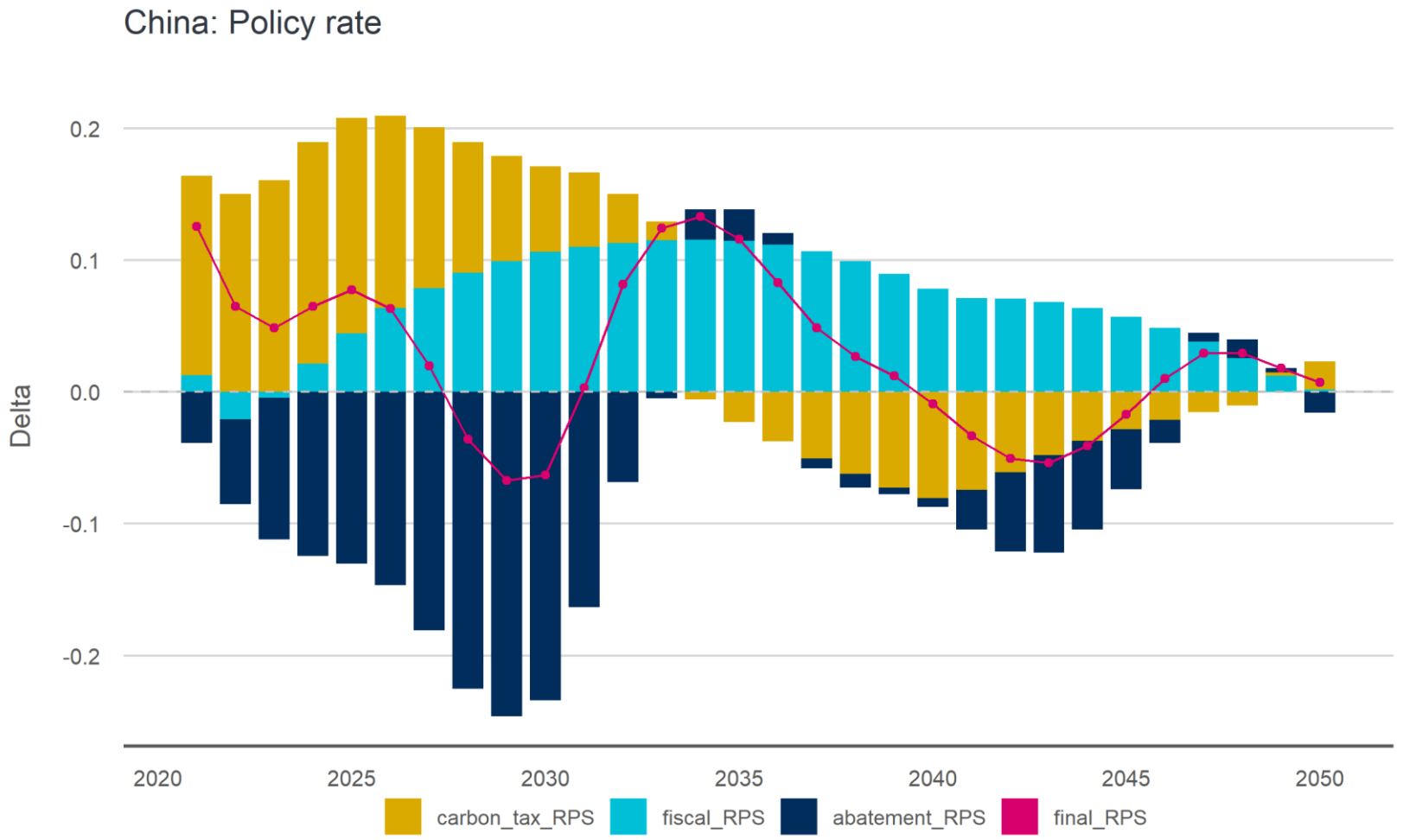
Policy rate cumulative transitional impacts: United States



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

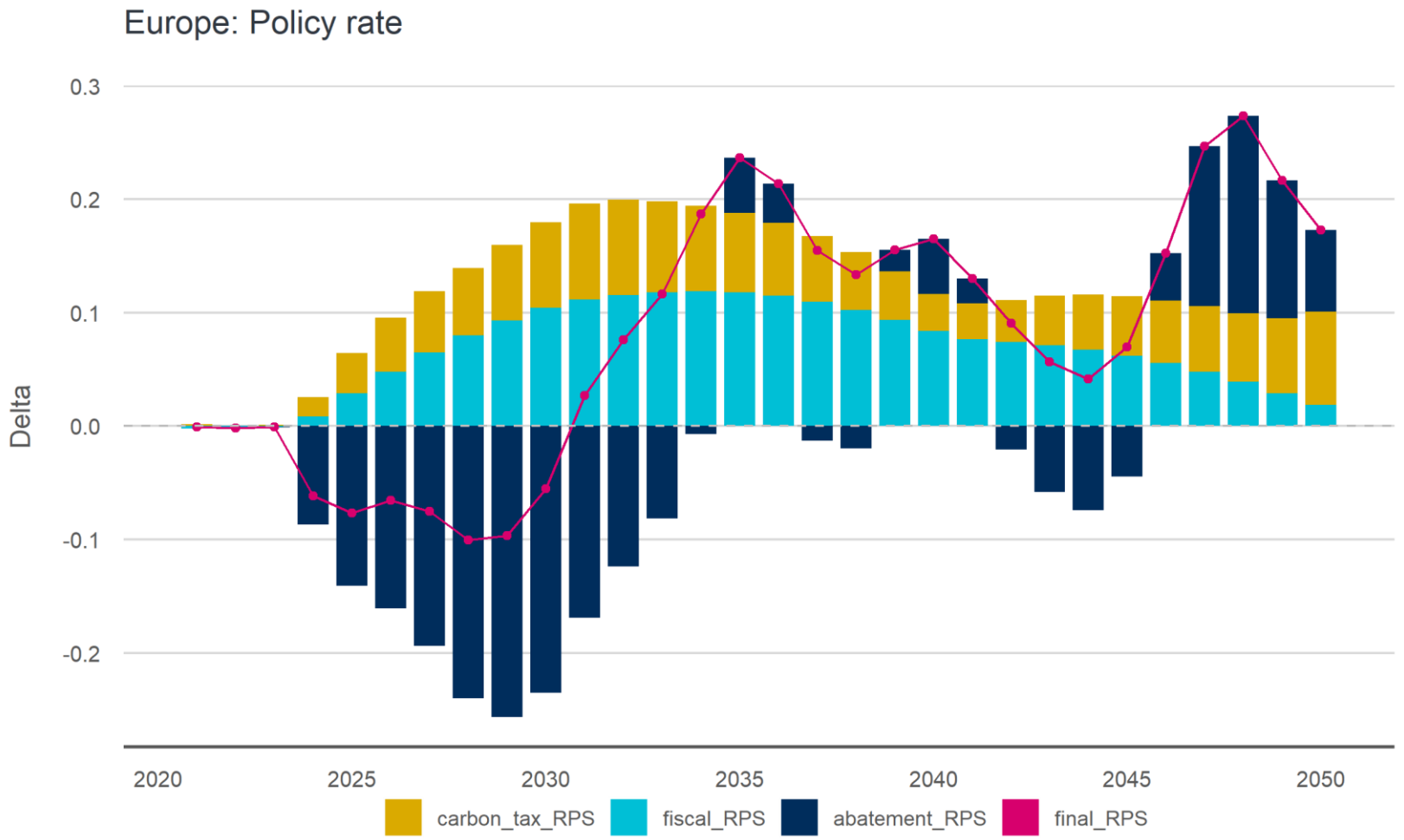
Policy rate cumulative transitional impacts: China



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

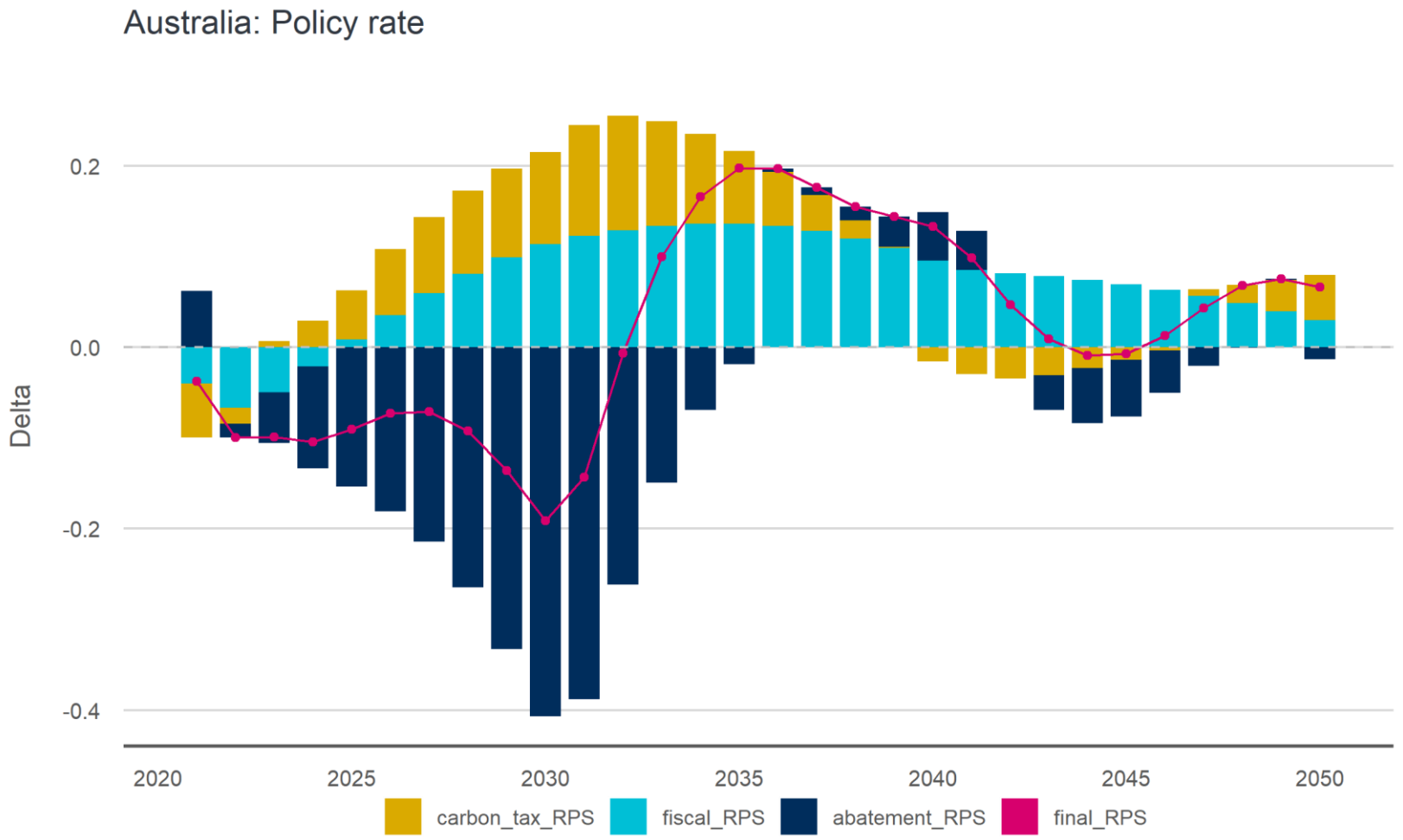
Policy rate cumulative transitional impacts: Europe



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

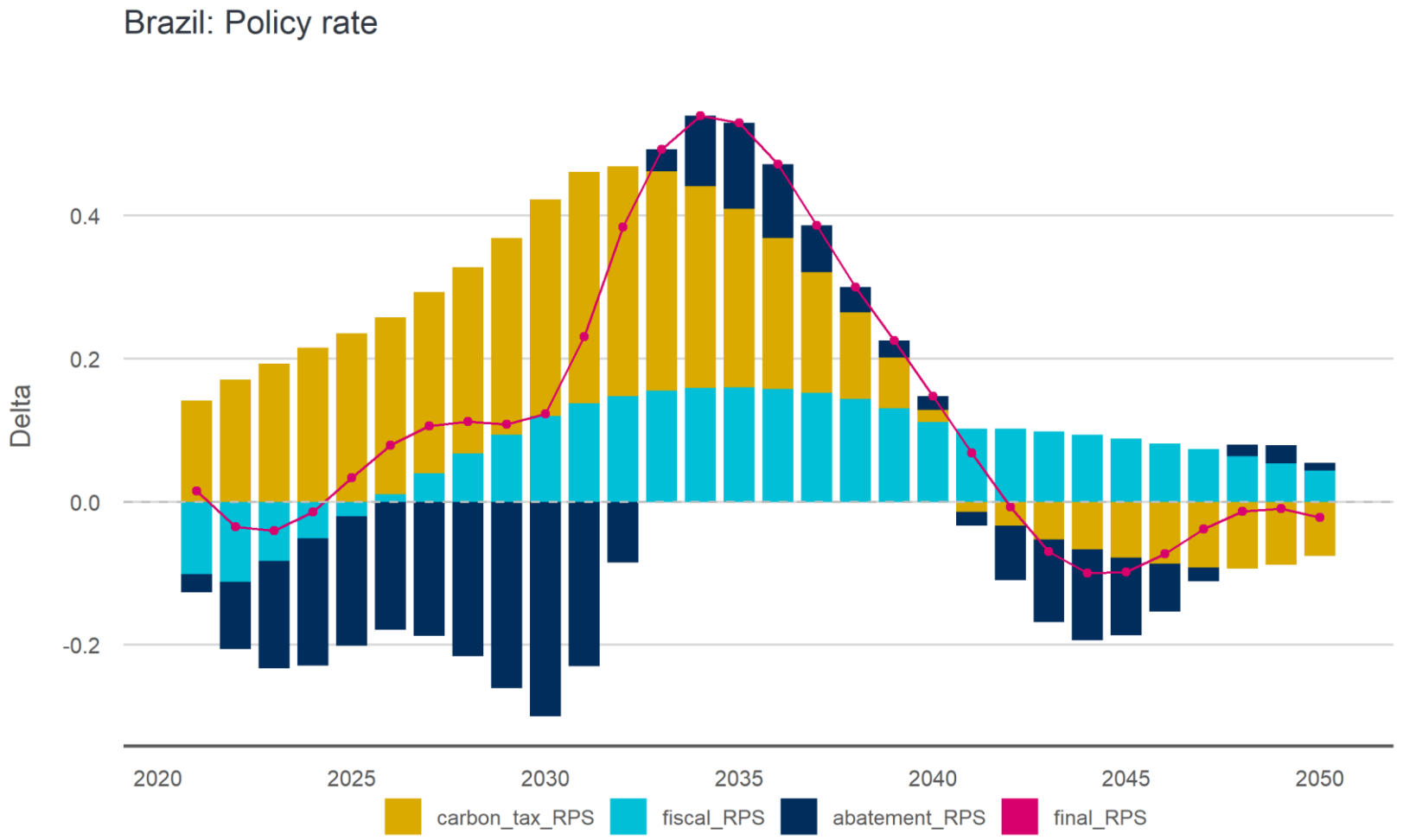
INEVITABLE POLICY RESPONSE

Policy rate cumulative transitional impacts: Australia



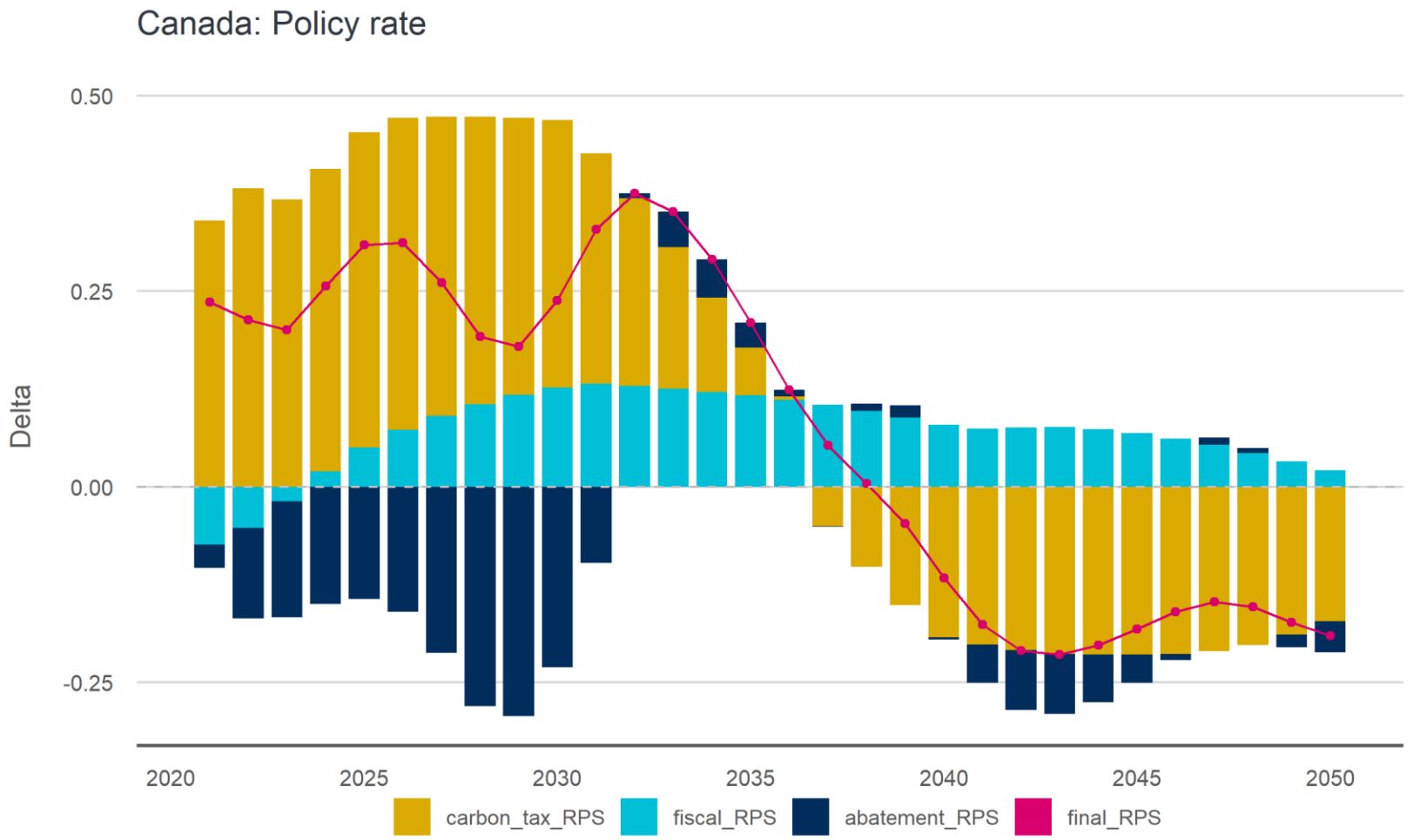
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

Policy rate cumulative transitional impacts: Brazil



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

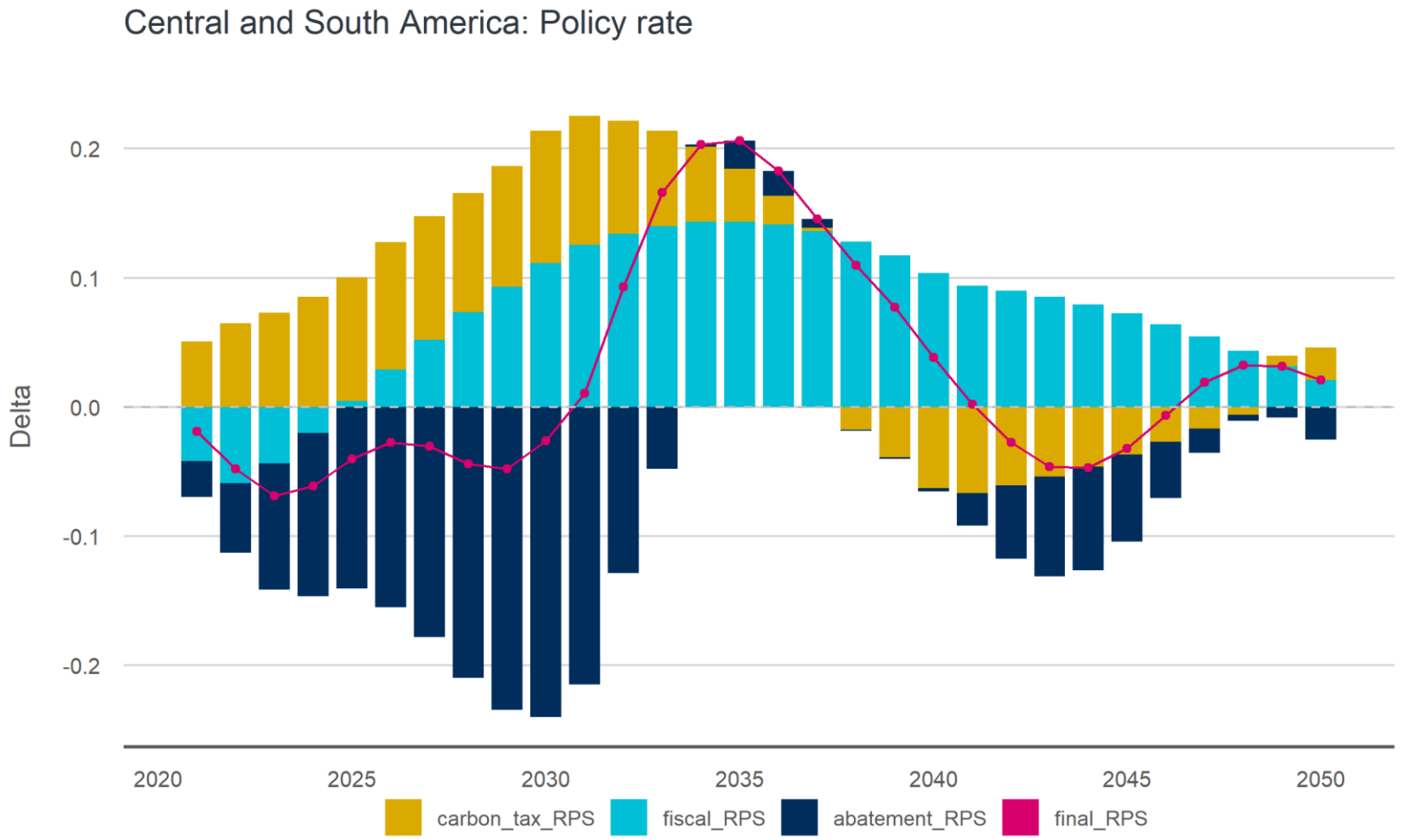
Policy rate cumulative transitional impacts: Canada



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

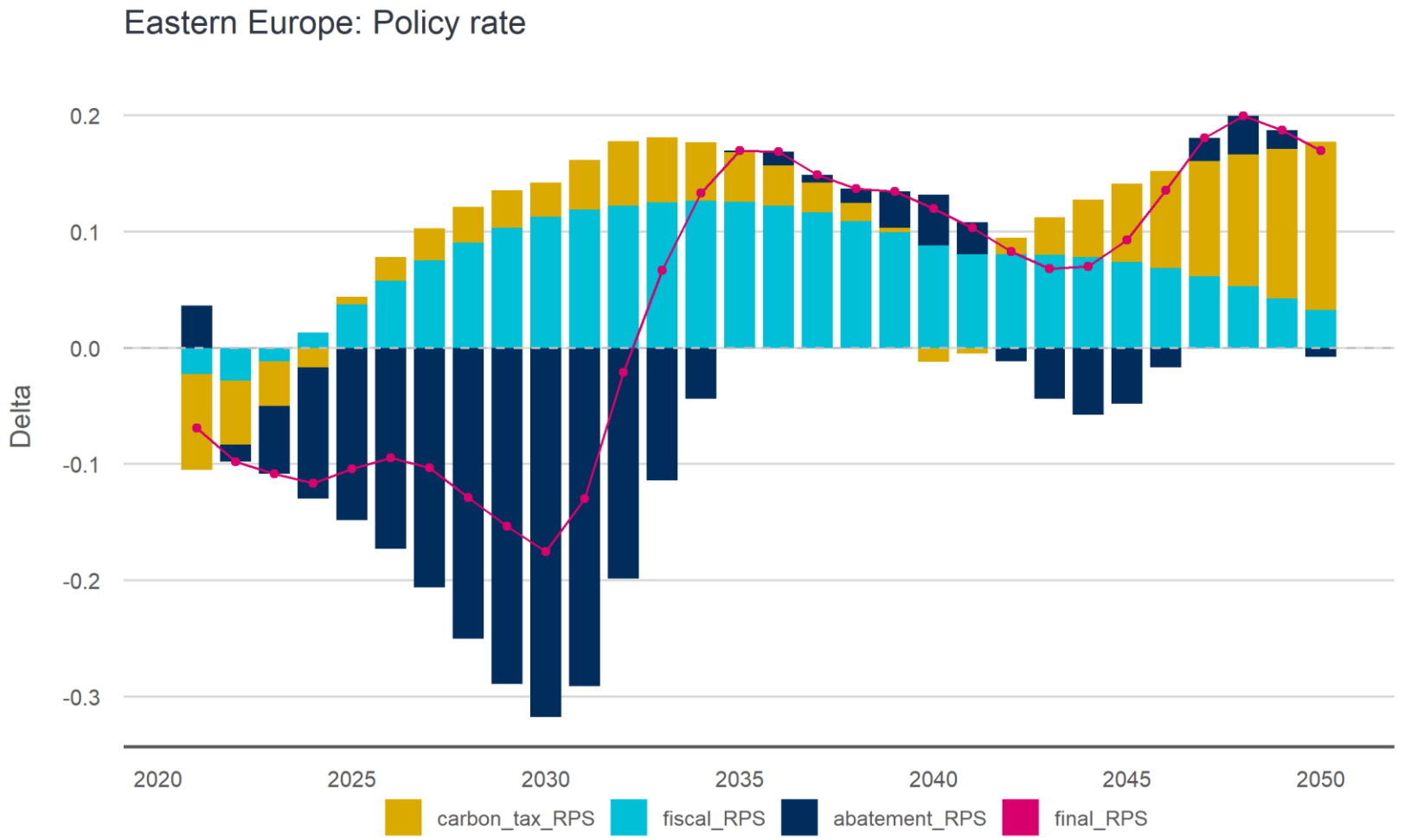
Policy rate cumulative transitional impacts: Central and South America



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

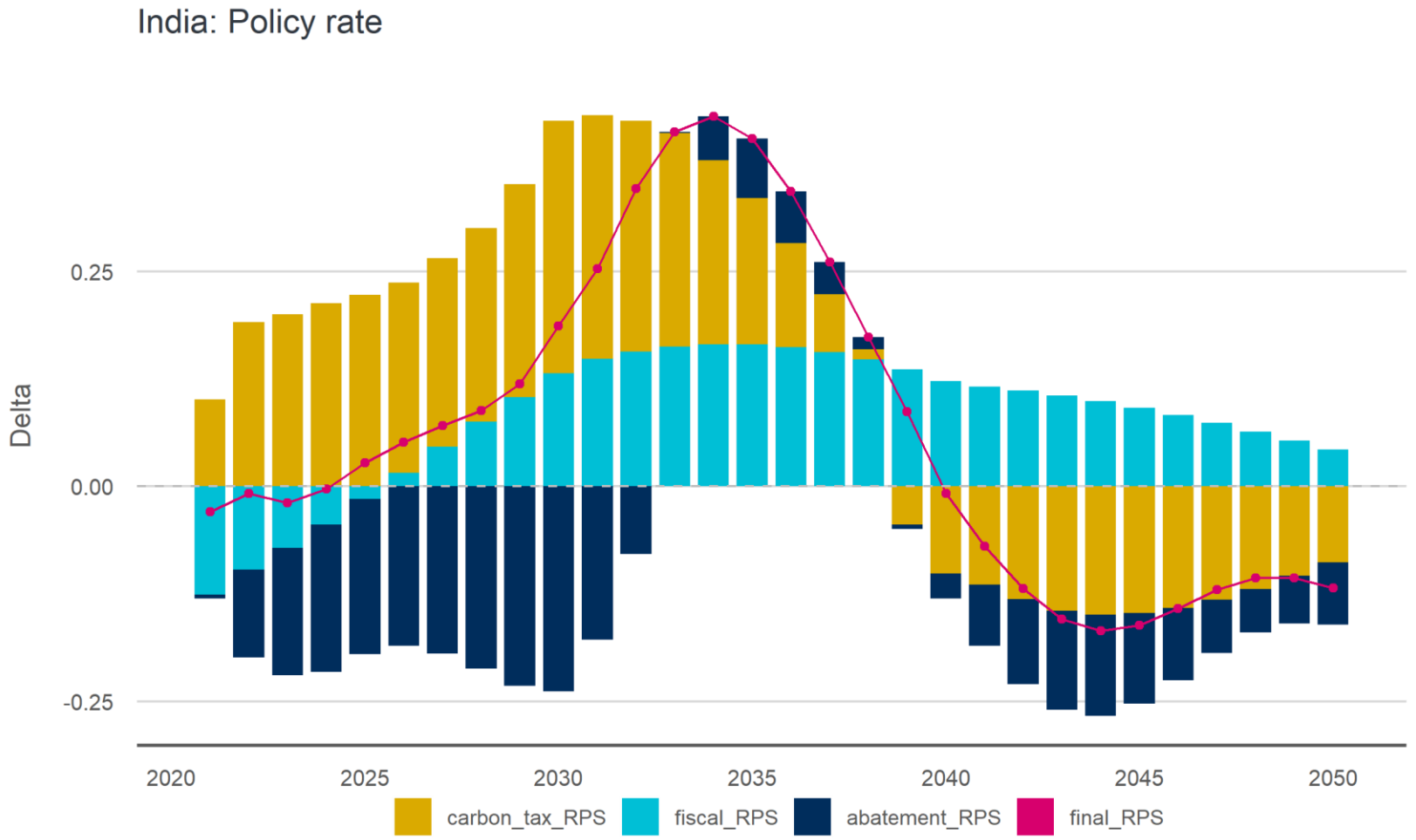
Policy rate cumulative transitional impacts: Eastern Europe



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

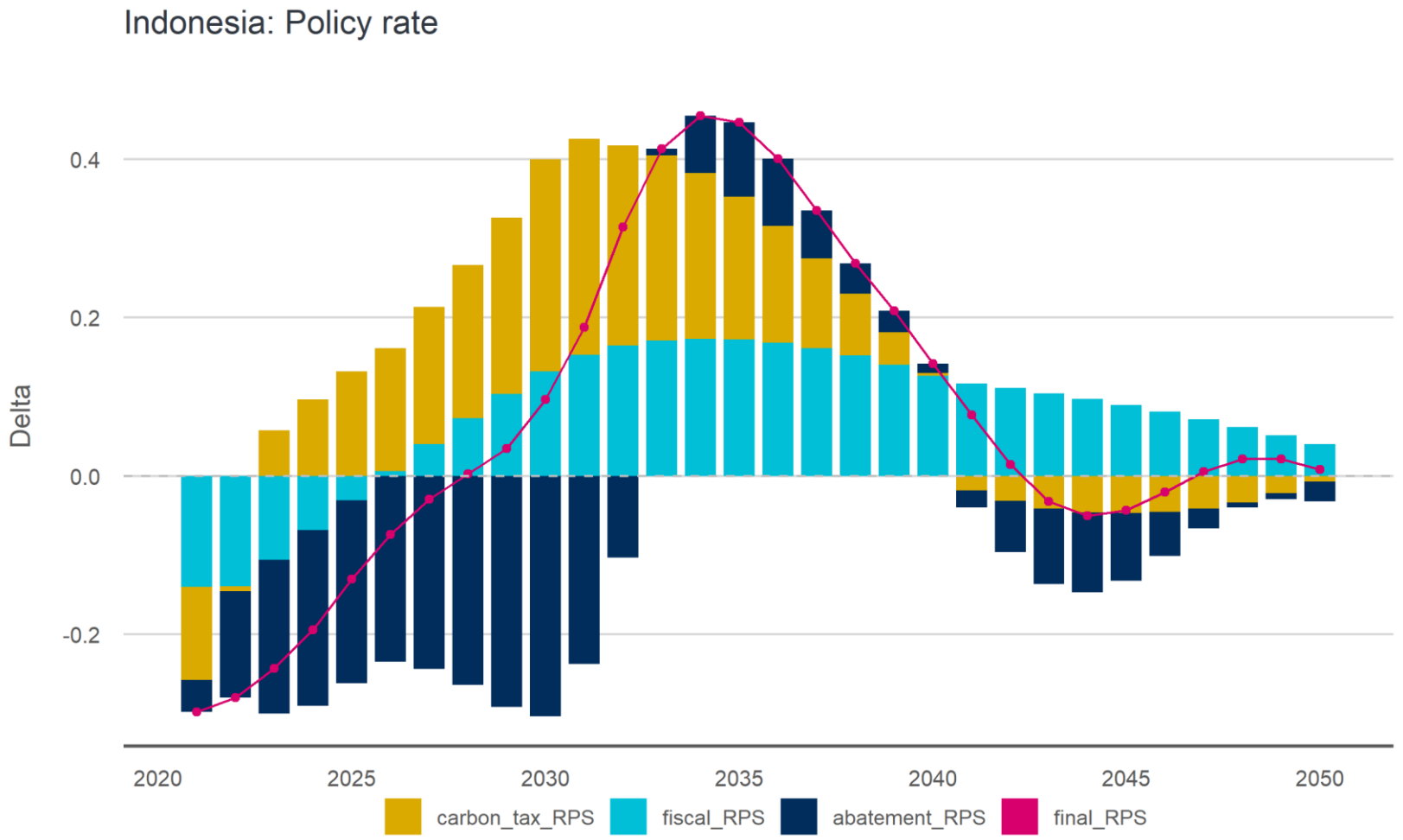
Policy rate cumulative transitional impacts: India



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

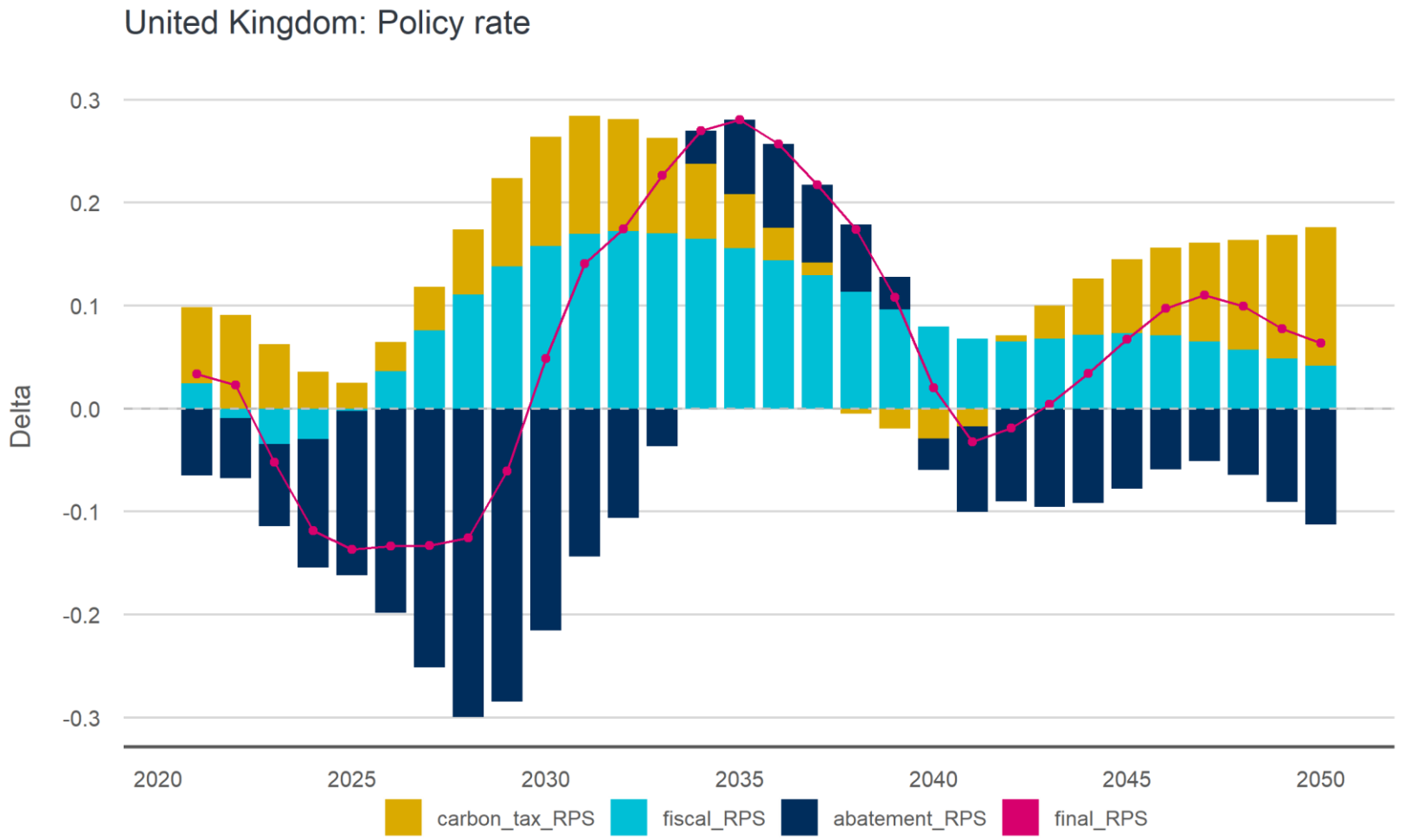
Policy rate cumulative transitional impacts: Indonesia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

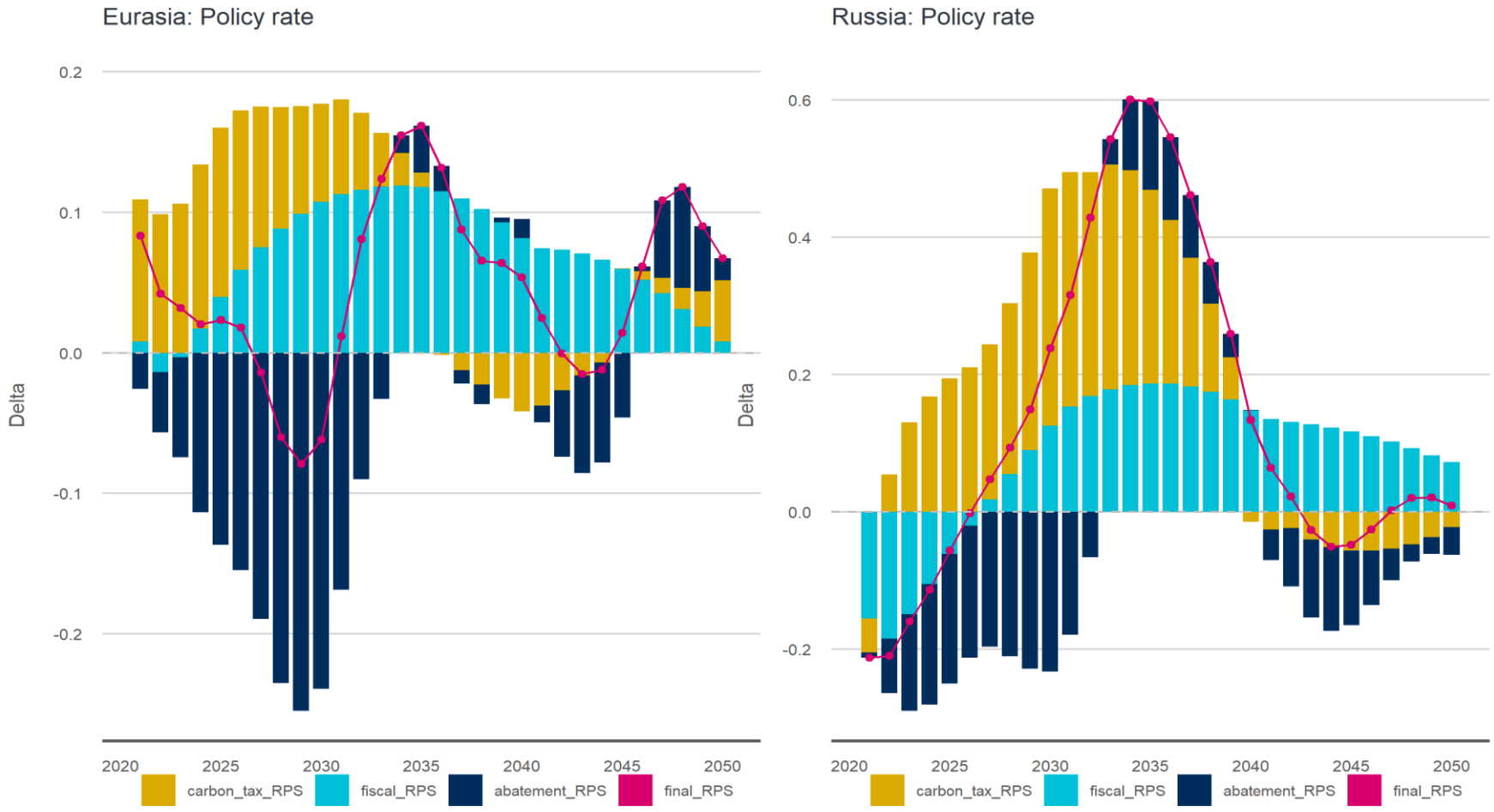
Policy rate cumulative transitional impacts: United Kingdom



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

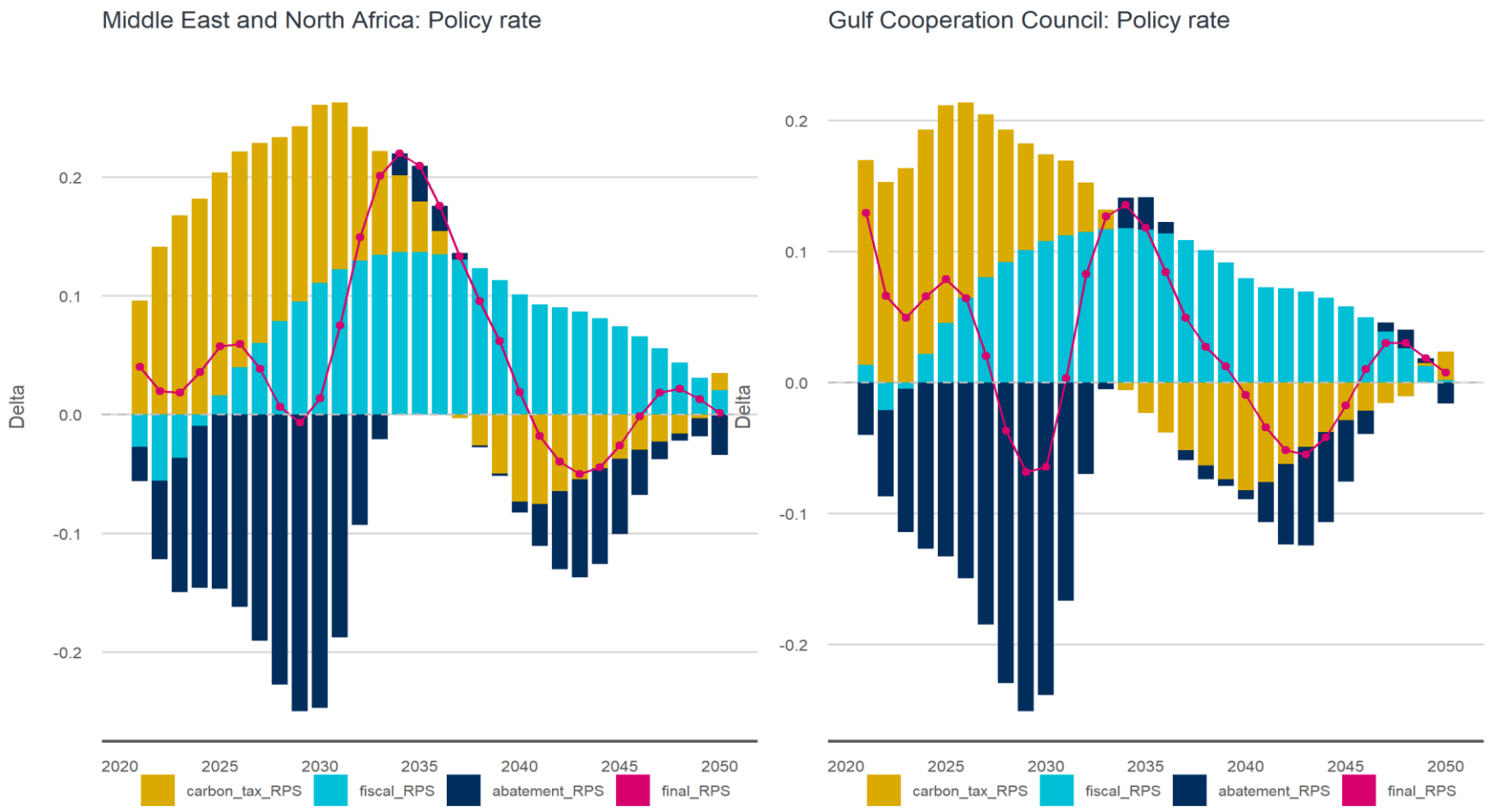
Policy rate cumulative transitional impacts: Eurasia and Russia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

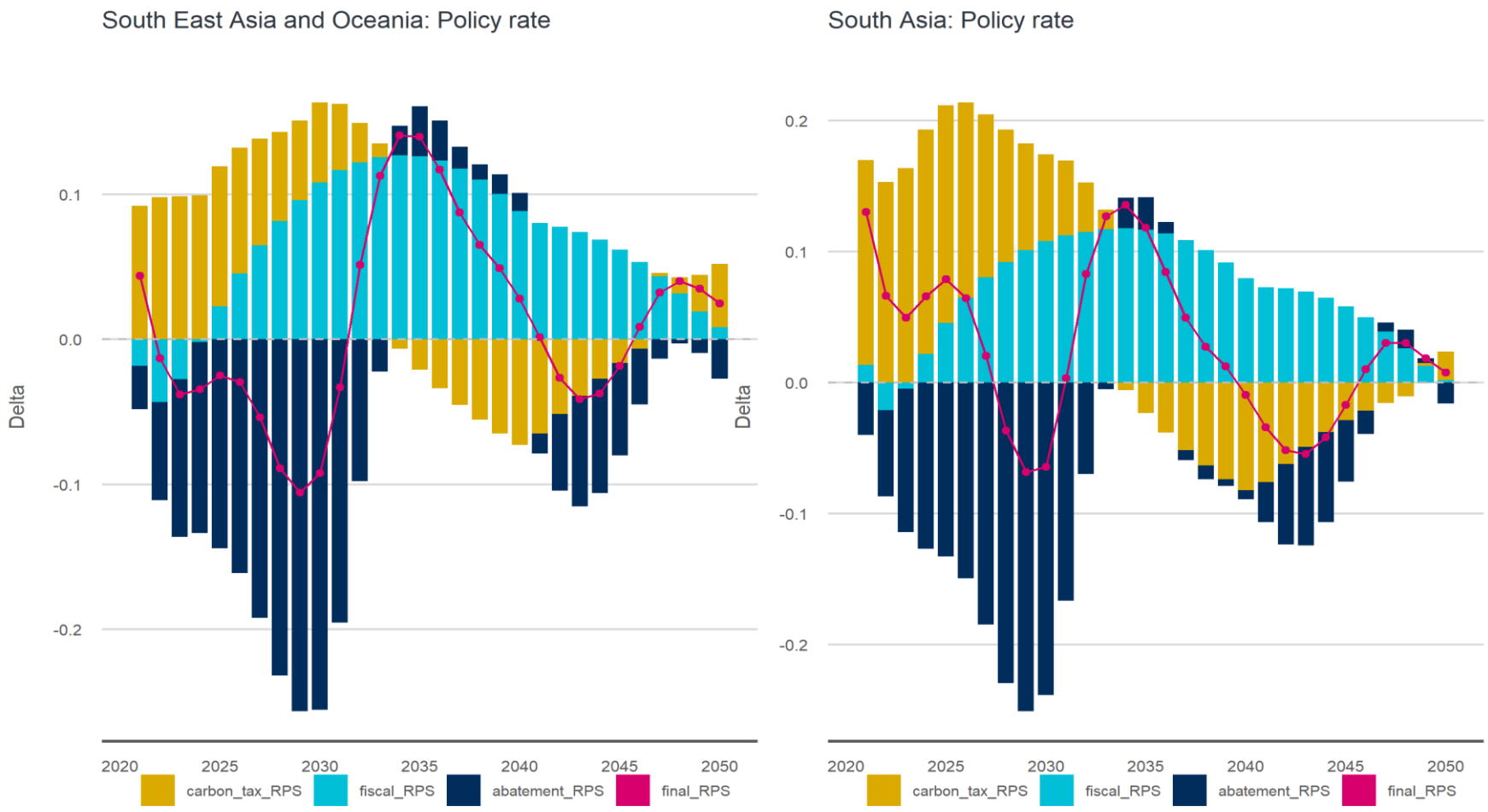
Policy rate cumulative transitional impacts: Gulf Cooperation Council, Middle East and N.A



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

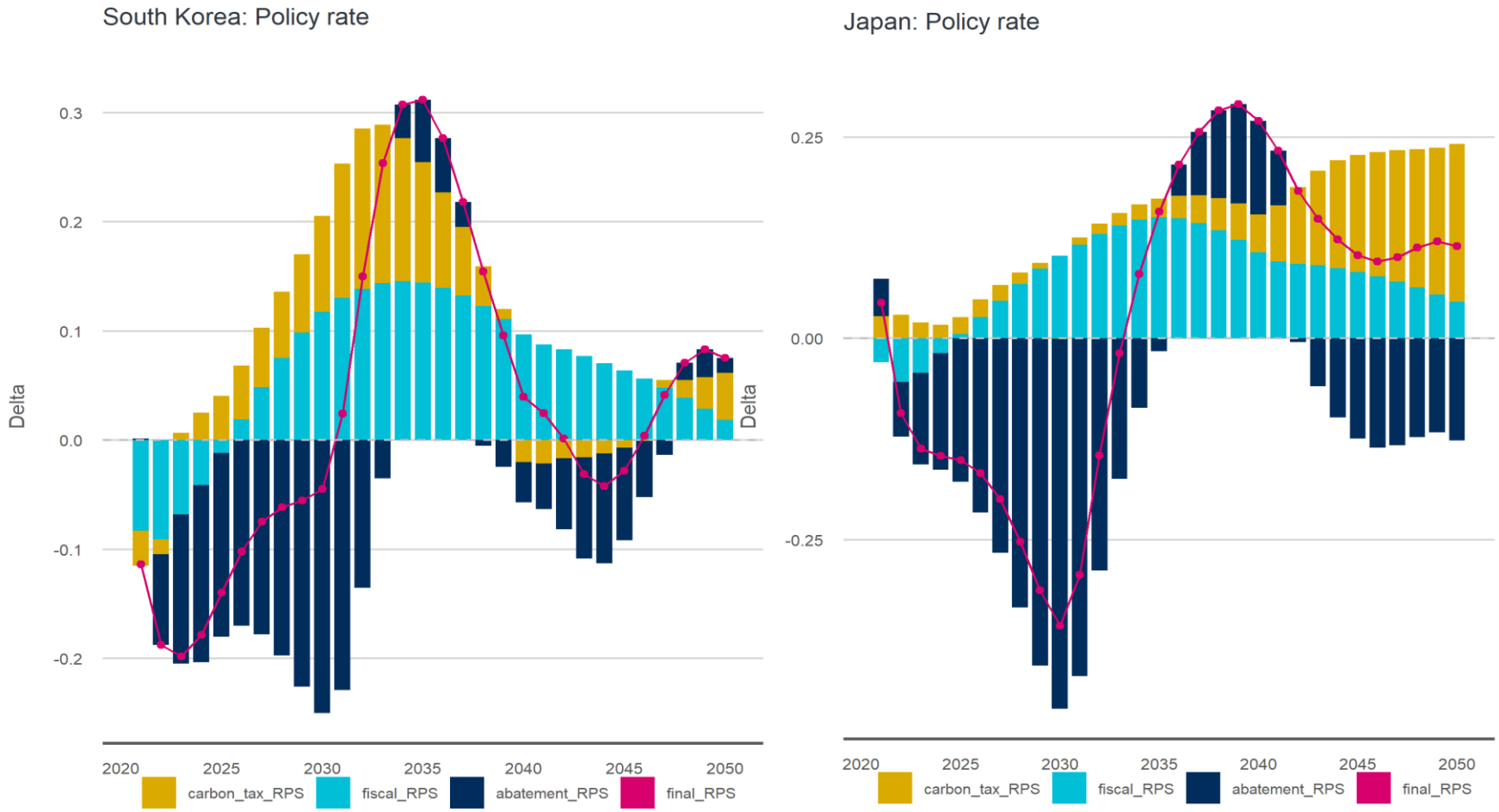
Policy rate cumulative transitional impacts: South East Asia and Oceania, South Asia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

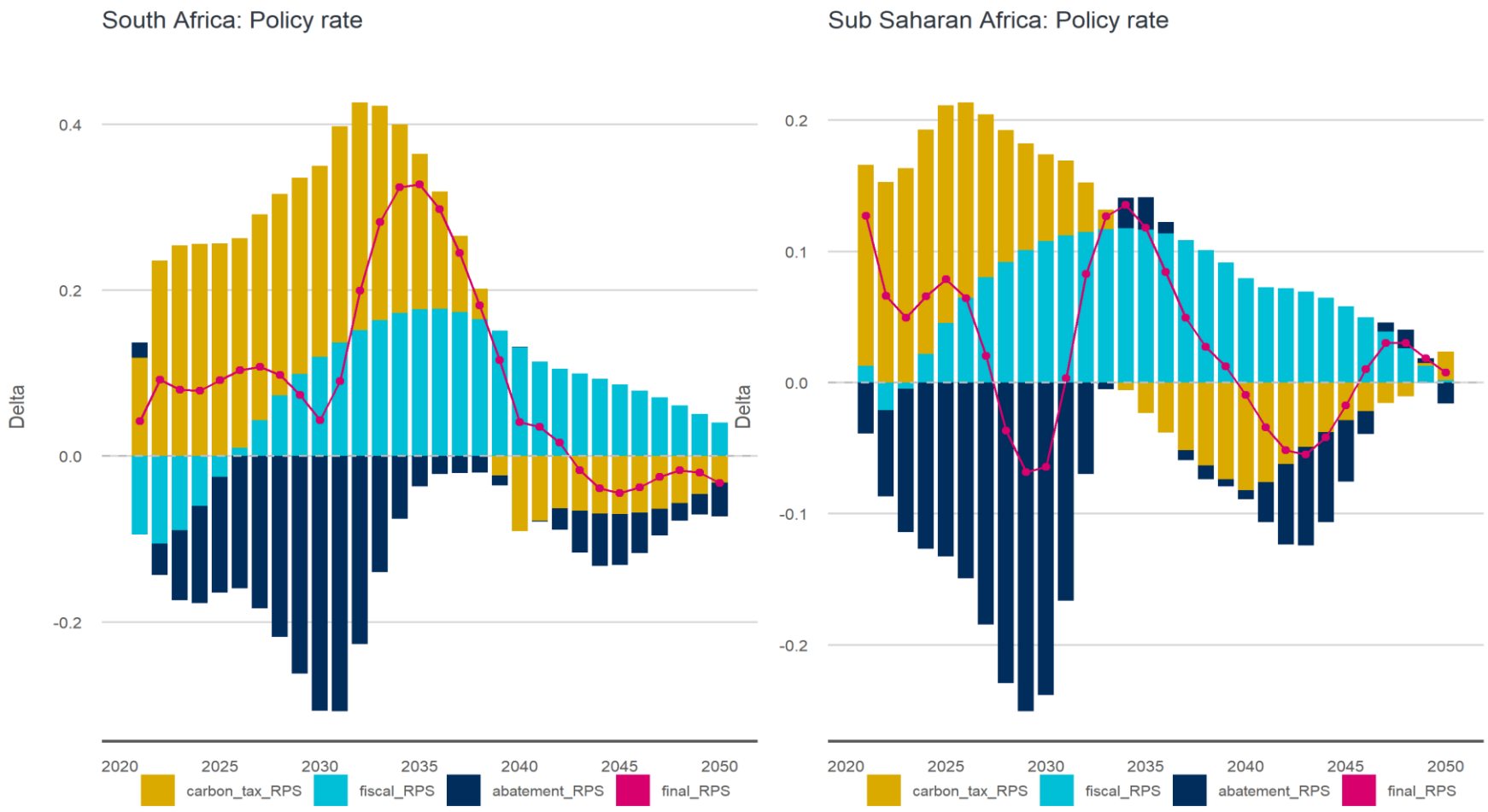
Policy rate cumulative transitional impacts: Japan, South Korea



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Policy rate cumulative transitional impacts: South Africa, Sub Saharan Africa



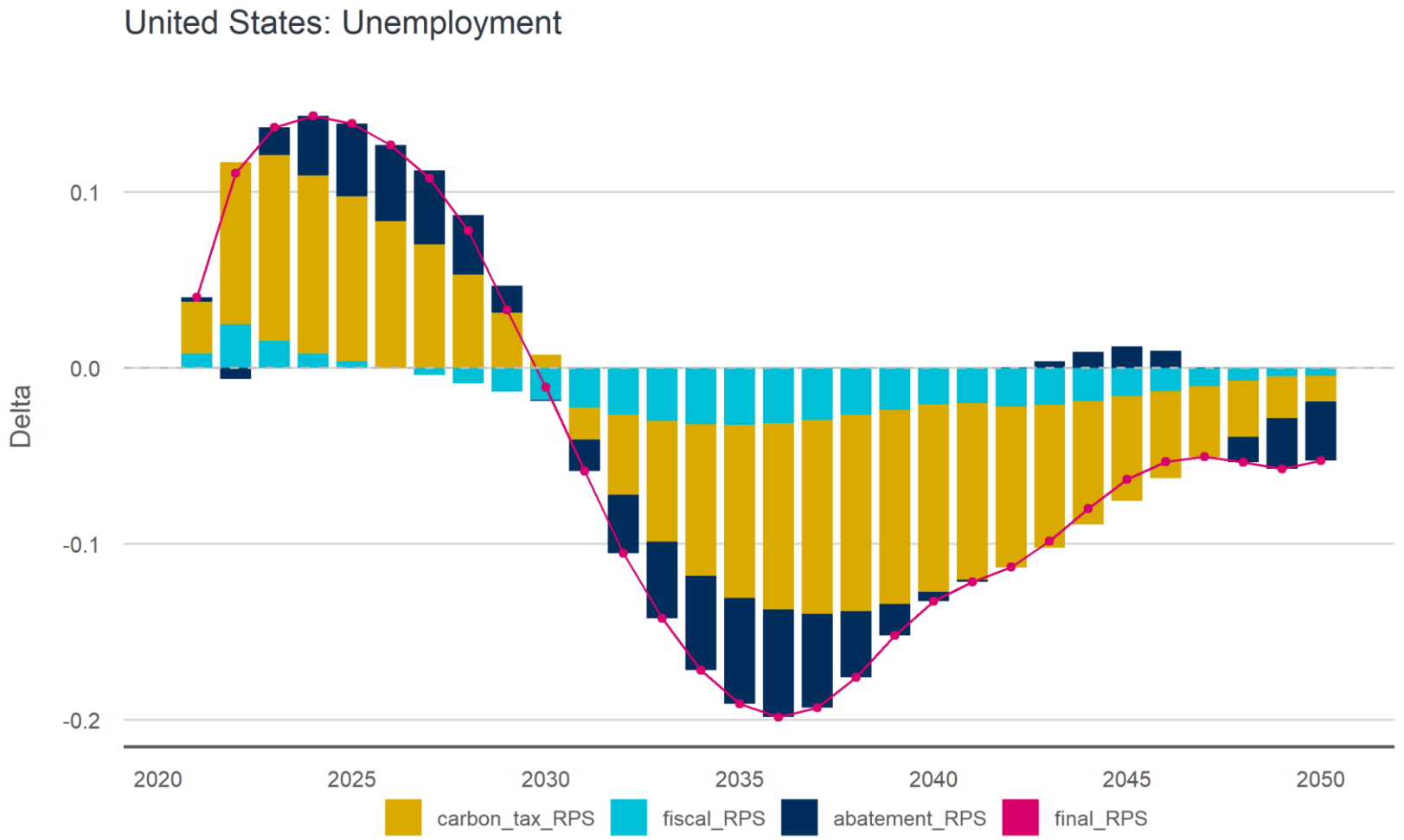
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Unemployment rate

INEVITABLE POLICY RESPONSE

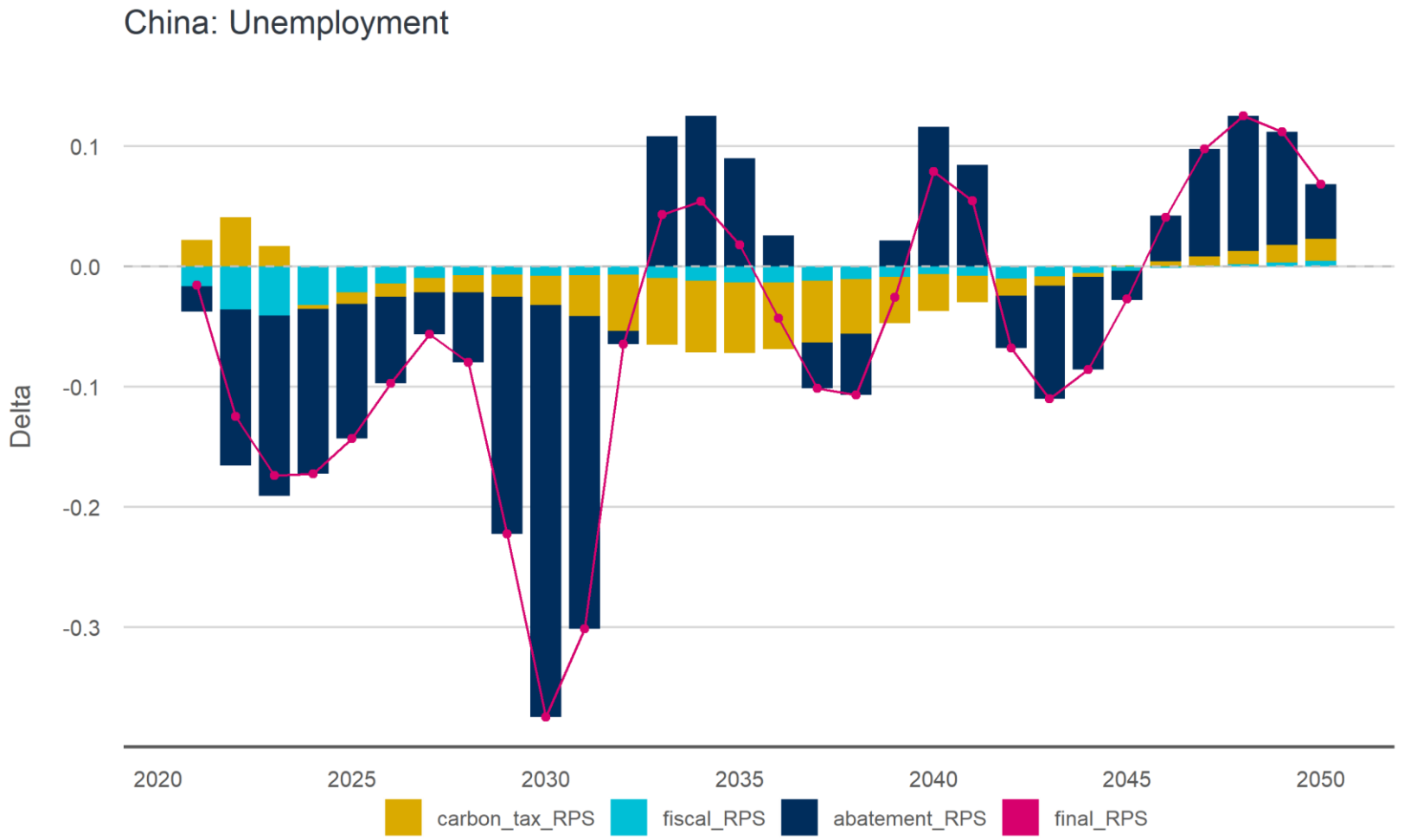
Unemployment rate cumulative transitional impacts: United States



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

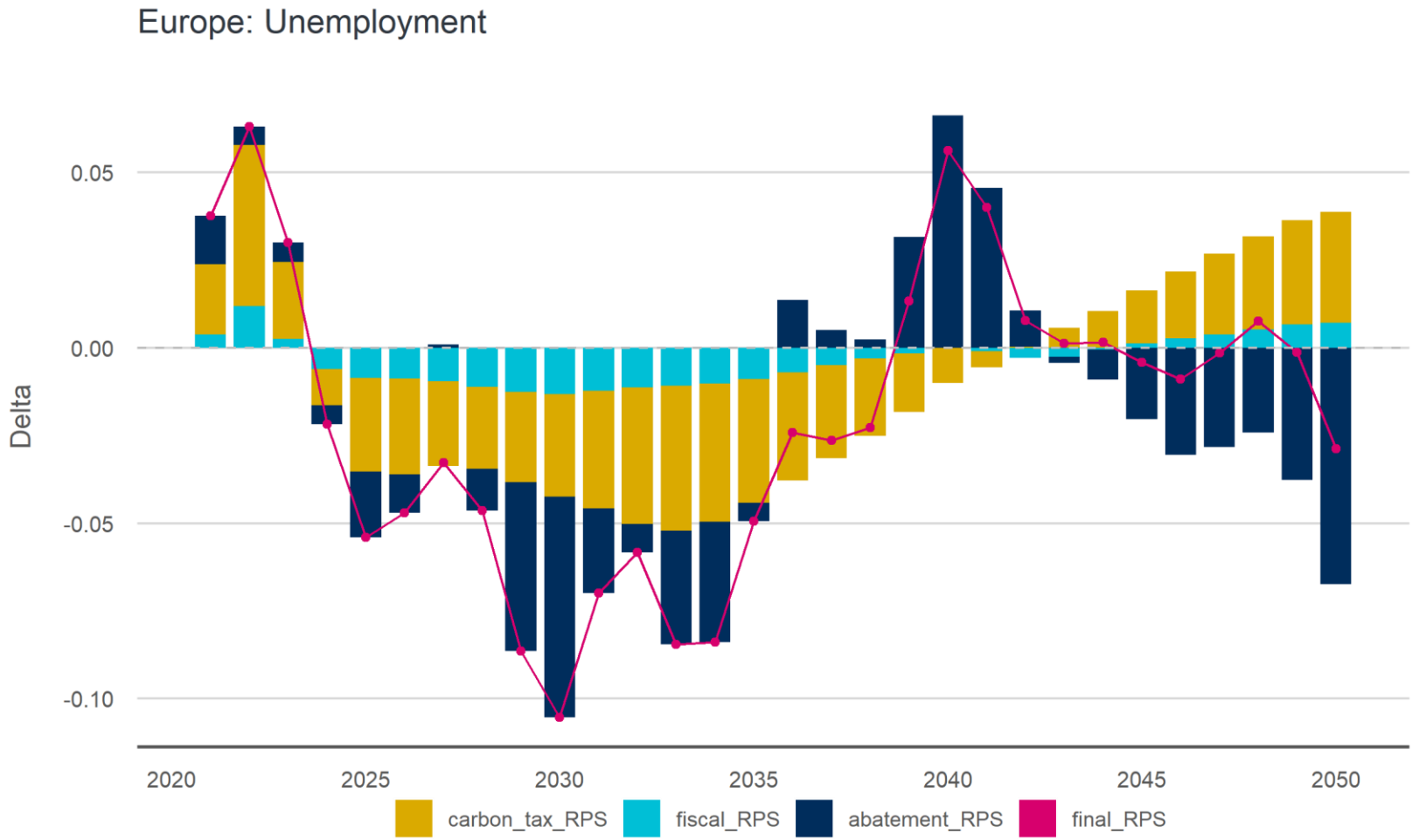
Unemployment rate cumulative transitional impacts: China



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

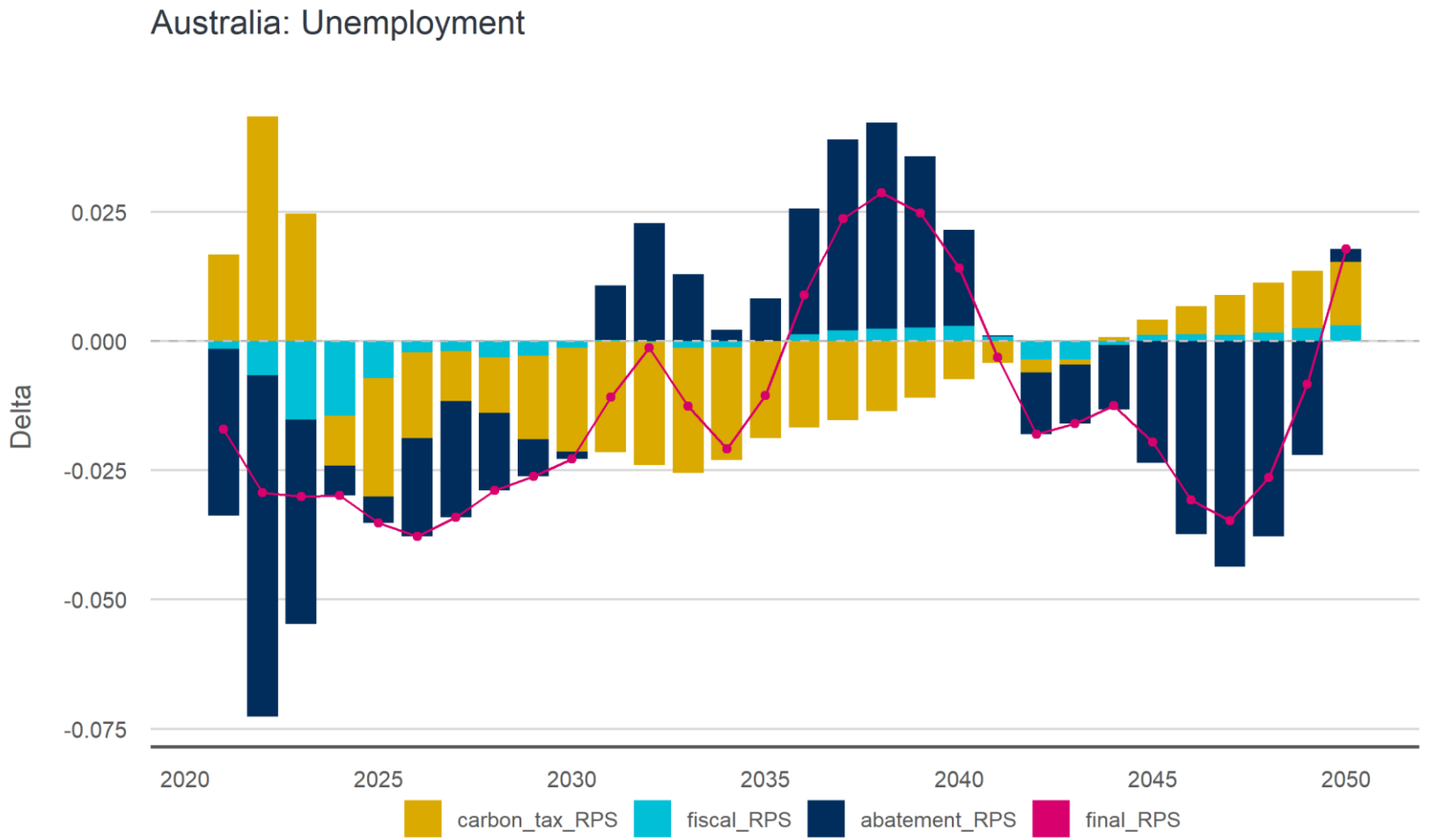
Unemployment rate cumulative transitional impacts: Europe



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

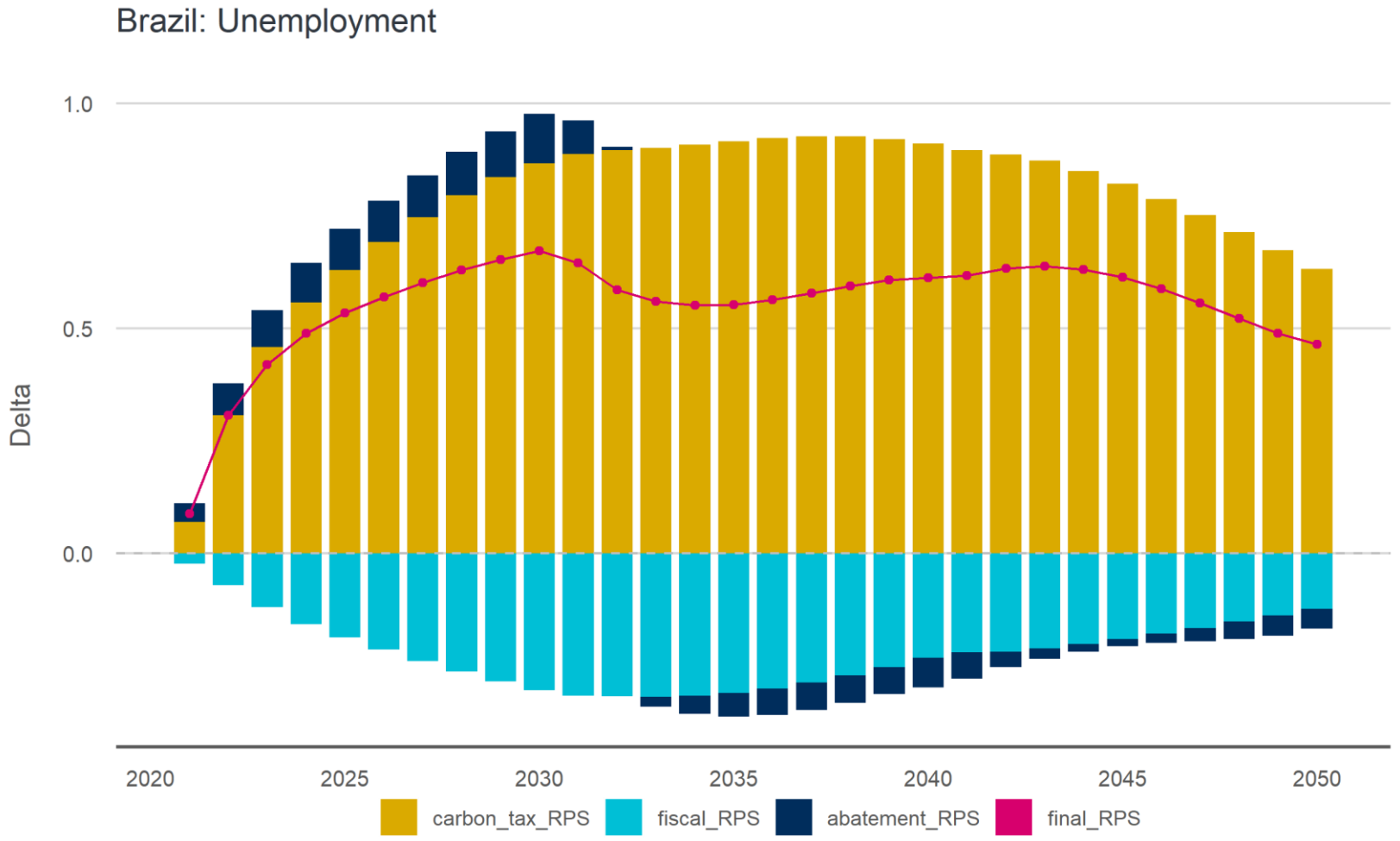
Unemployment rate cumulative transitional impacts: Australia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

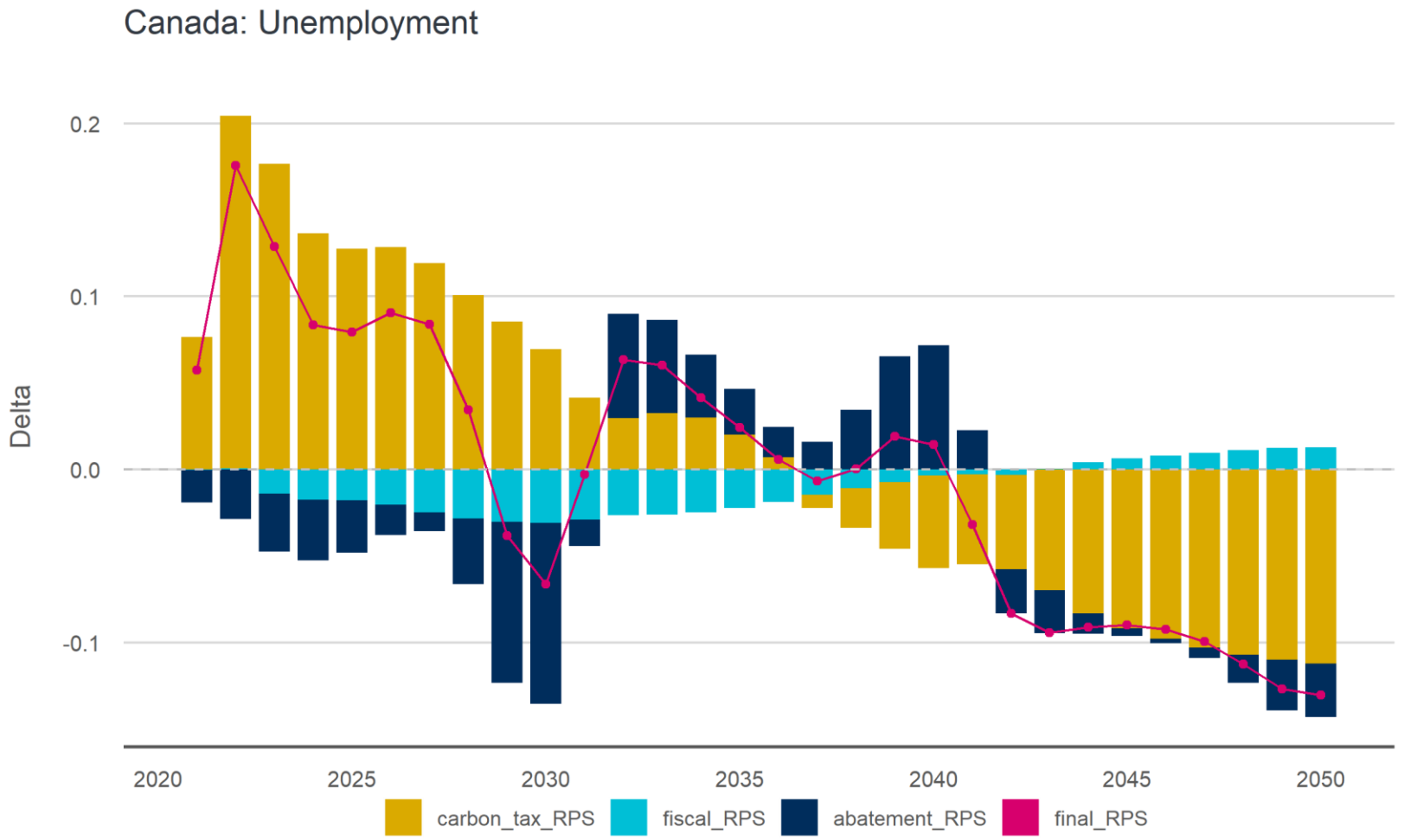
INEVITABLE POLICY RESPONSE

Unemployment rate cumulative transitional impacts: Brazil



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

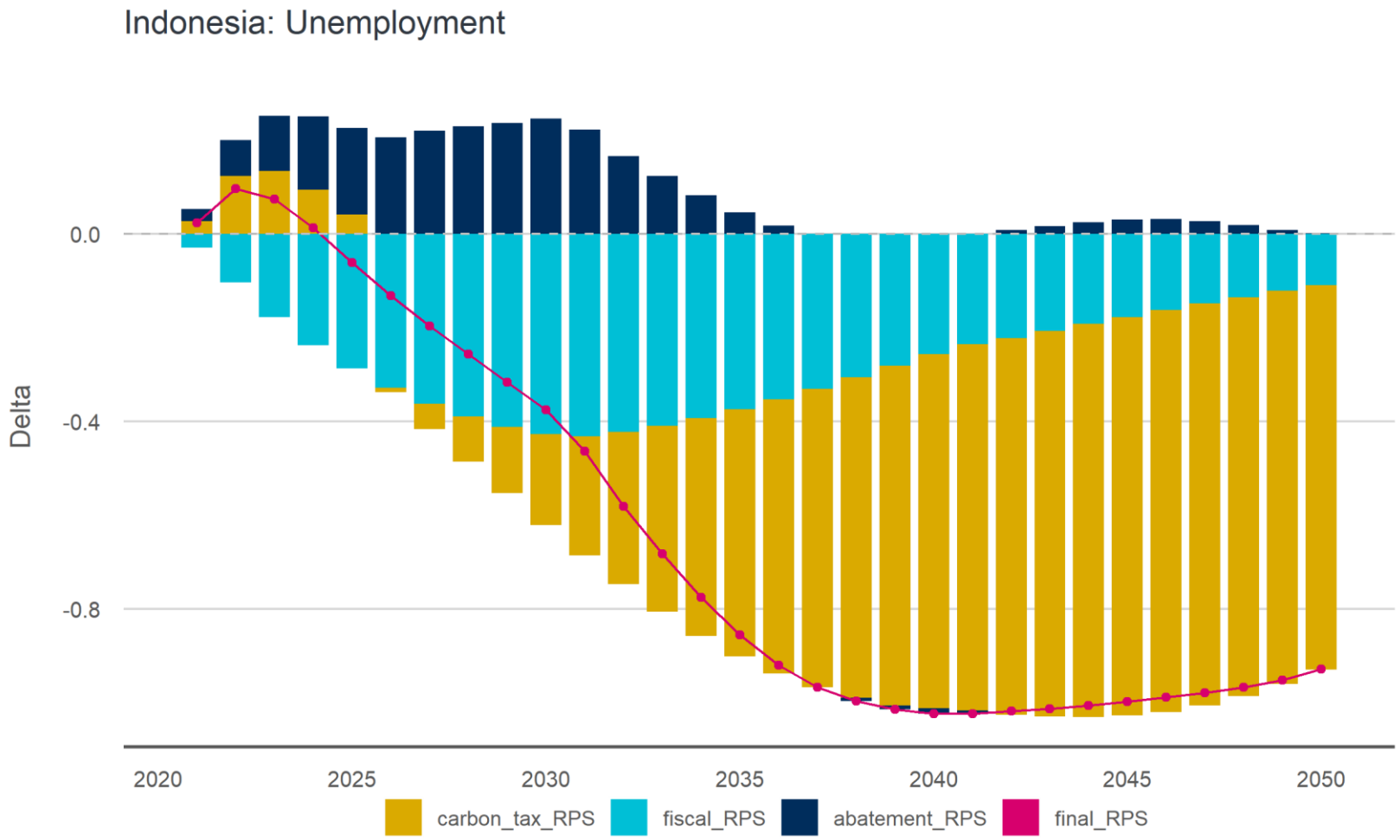
Unemployment rate cumulative transitional impacts: Canada



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

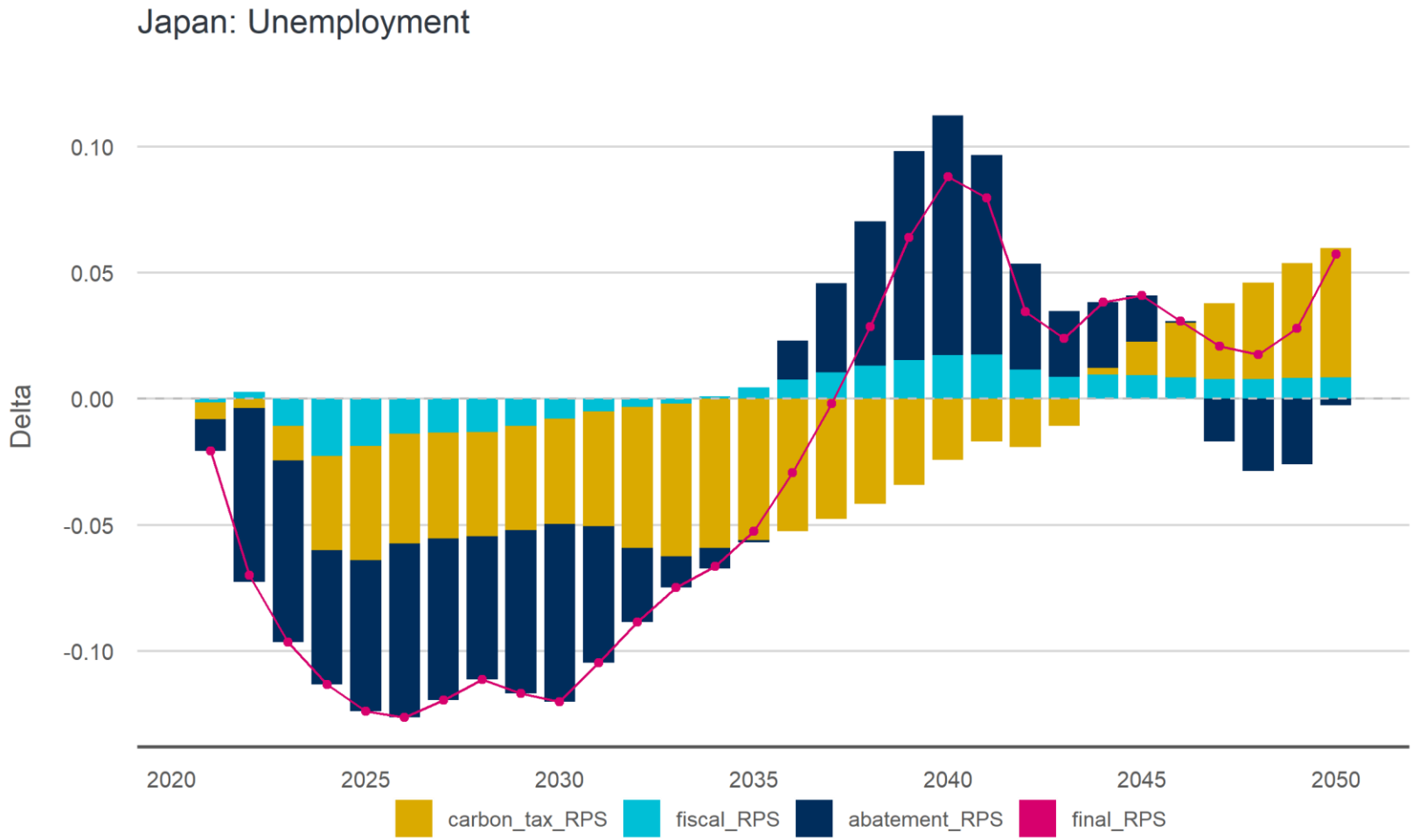
Unemployment rate cumulative transitional impacts: Indonesia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

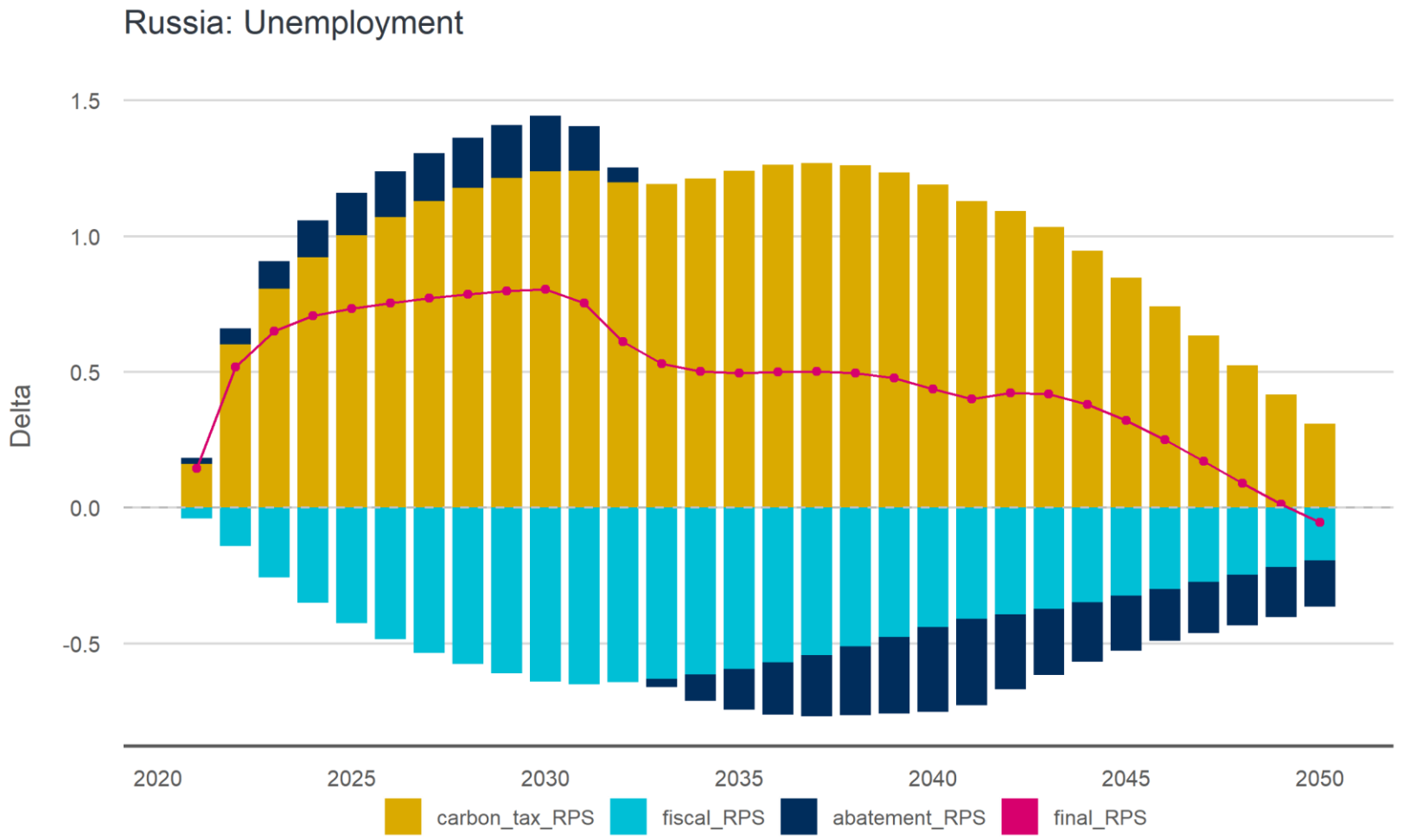
Unemployment rate cumulative transitional impacts: Japan



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

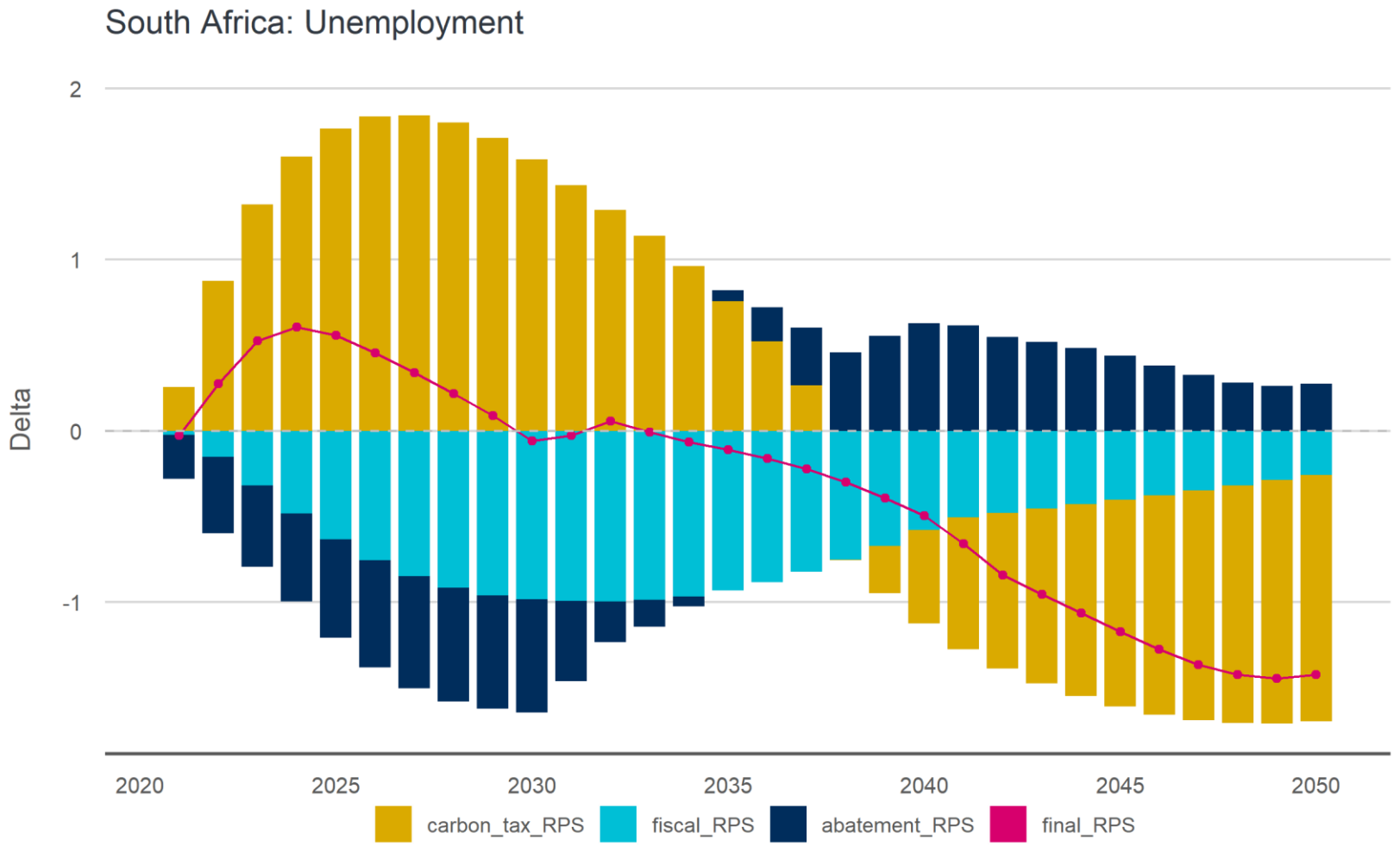
INEVITABLE POLICY RESPONSE

Unemployment rate cumulative transitional impacts: Russia



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

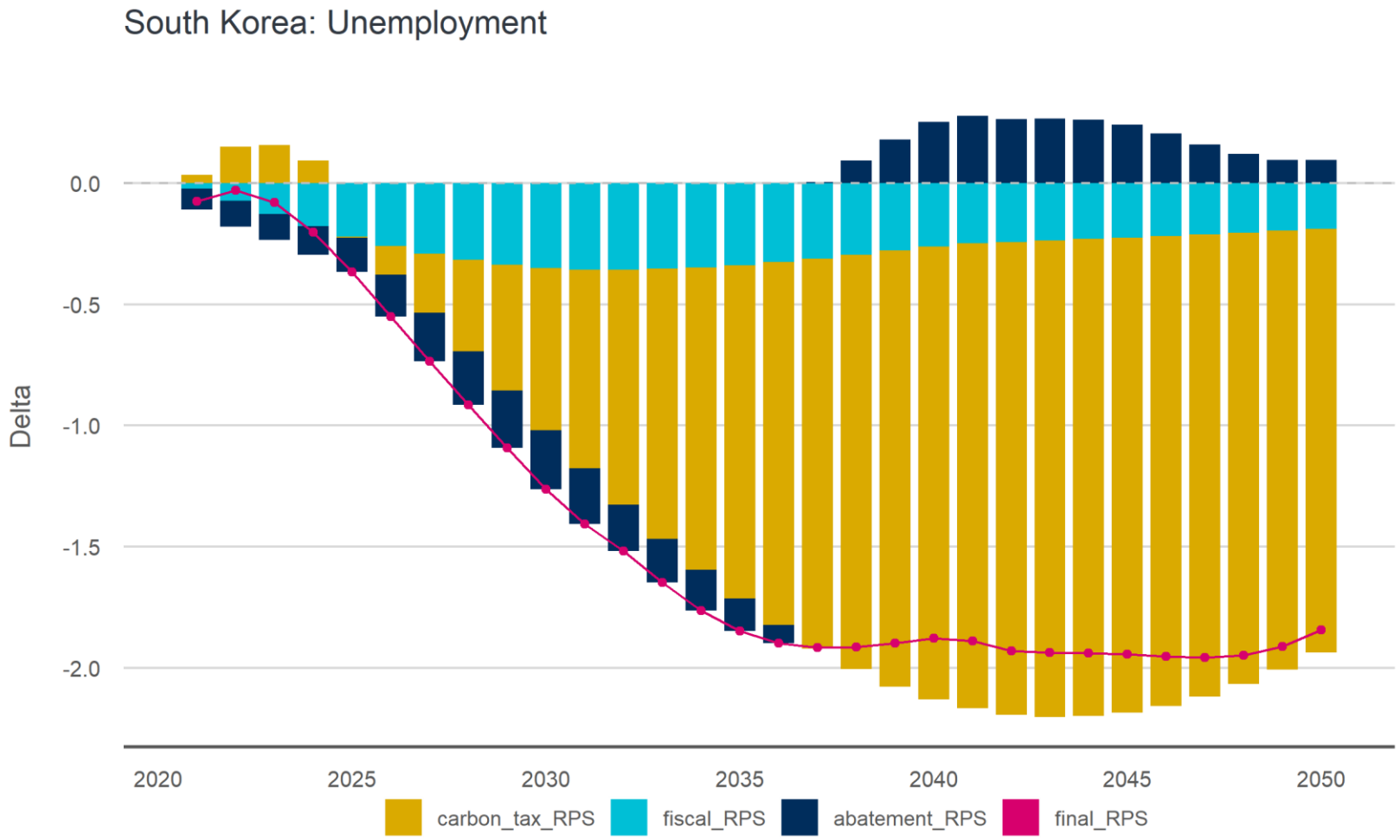
Unemployment rate cumulative transitional impacts: South Africa



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

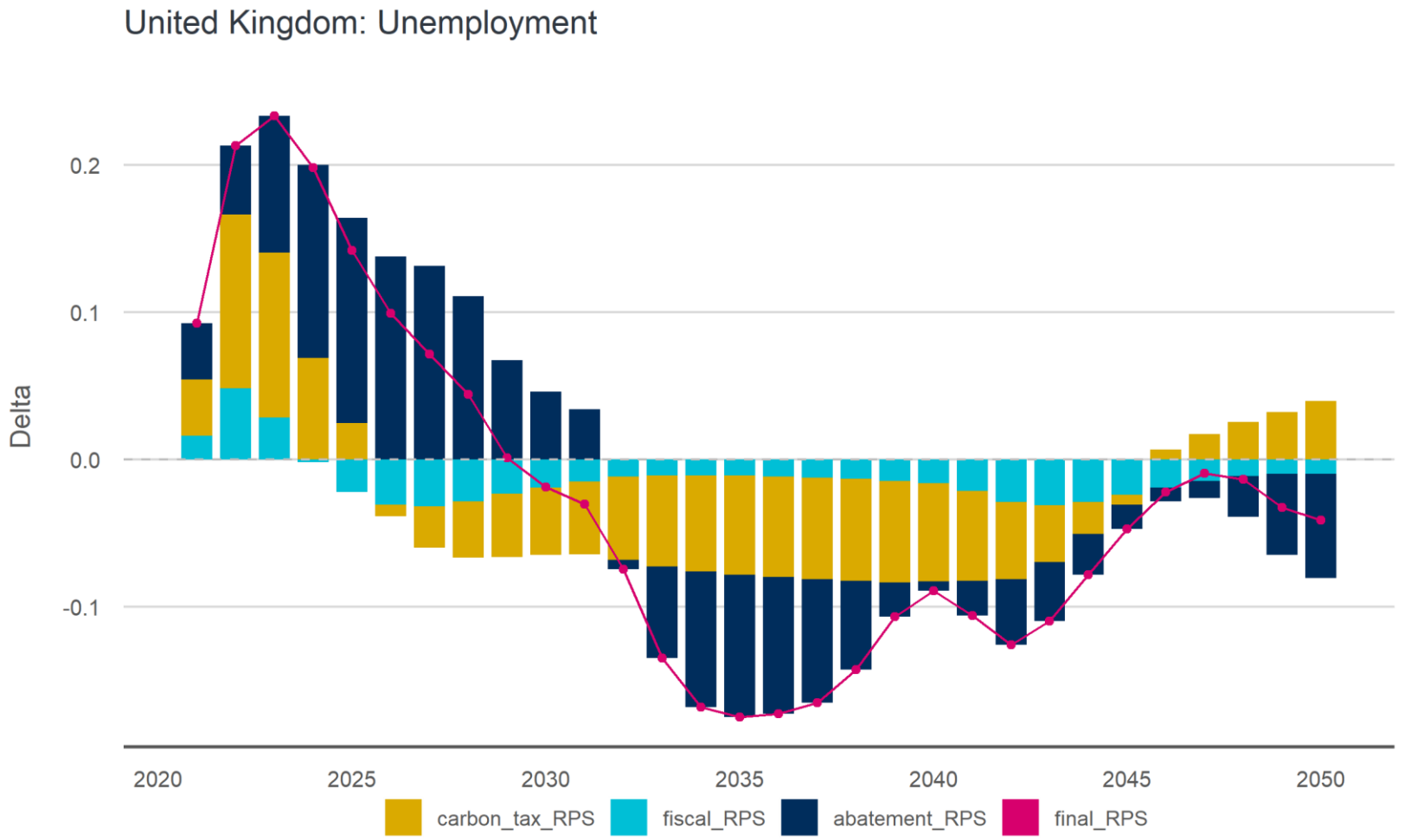
Unemployment rate cumulative transitional impacts: South Korea



Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Unemployment rate cumulative transitional impacts: United Kingdom



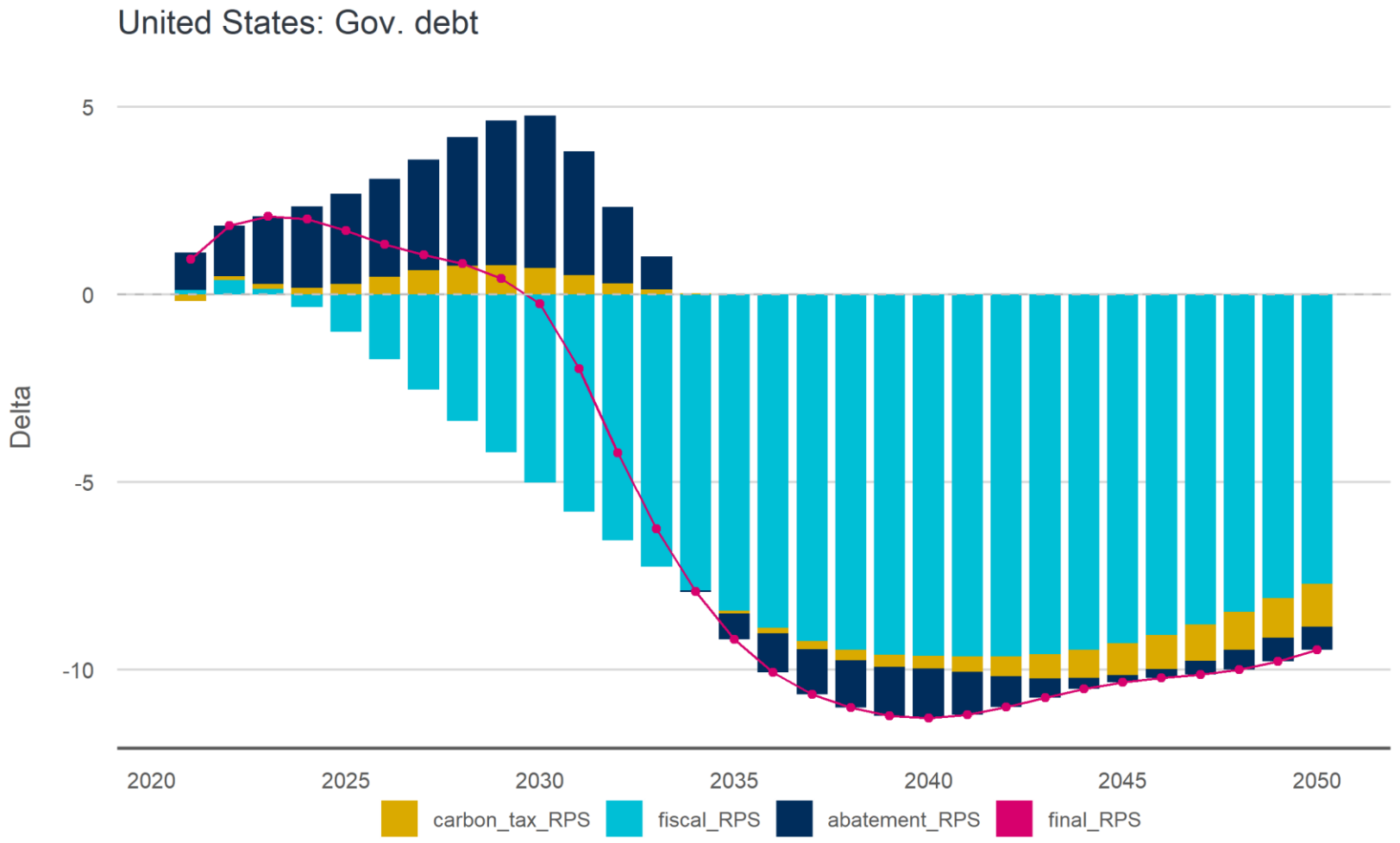
Note: Delta is calculated as the absolute difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Government debt

INEVITABLE POLICY RESPONSE

Government debt cumulative transitional impacts: United States

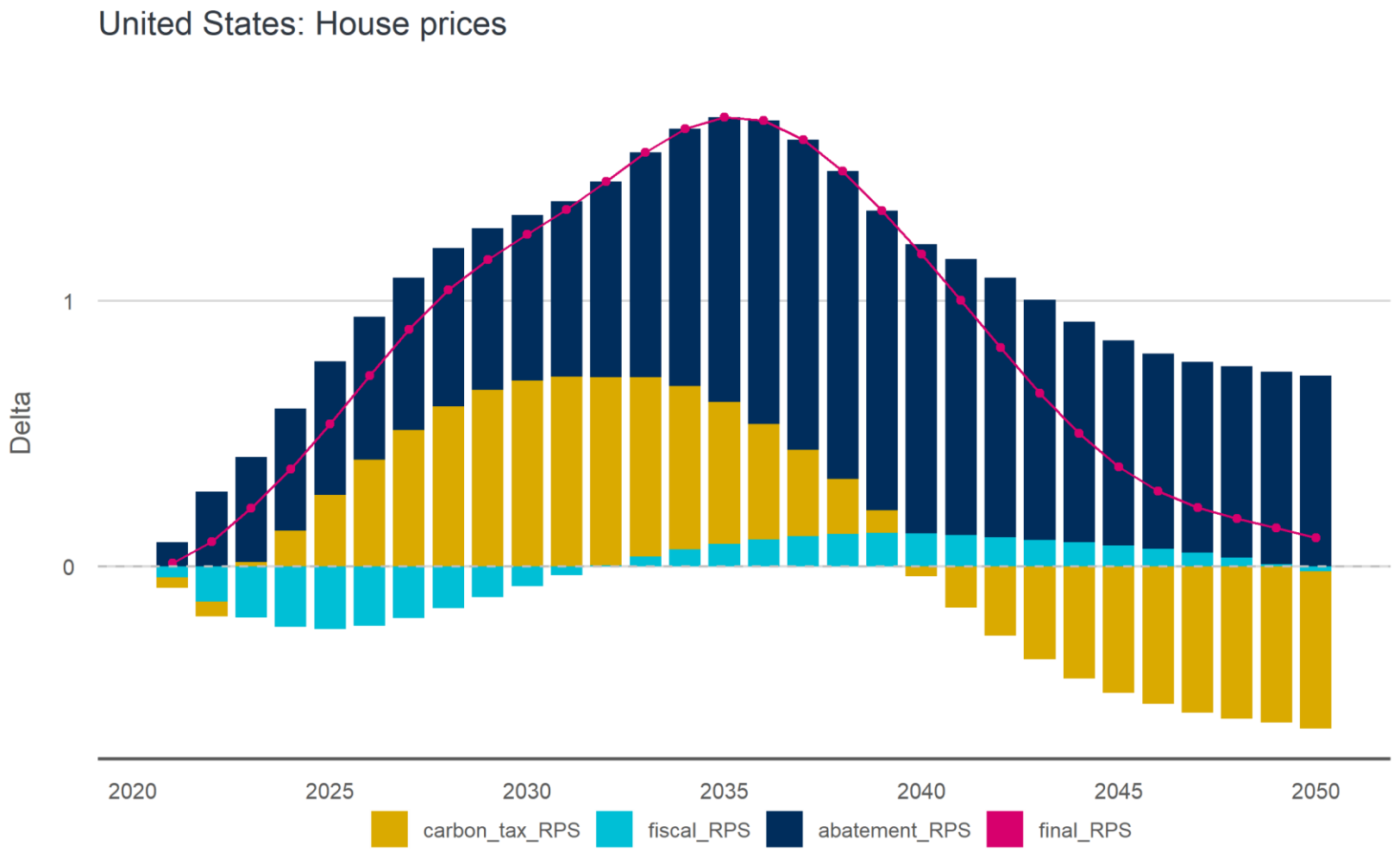


Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: House Prices

INEVITABLE POLICY RESPONSE

House prices cumulative transitional impacts: United States



Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

The Inevitable Policy Response: IPR 1.5°C RPS scenario – Appendix: Effective exchange rates

INEVITABLE POLICY RESPONSE

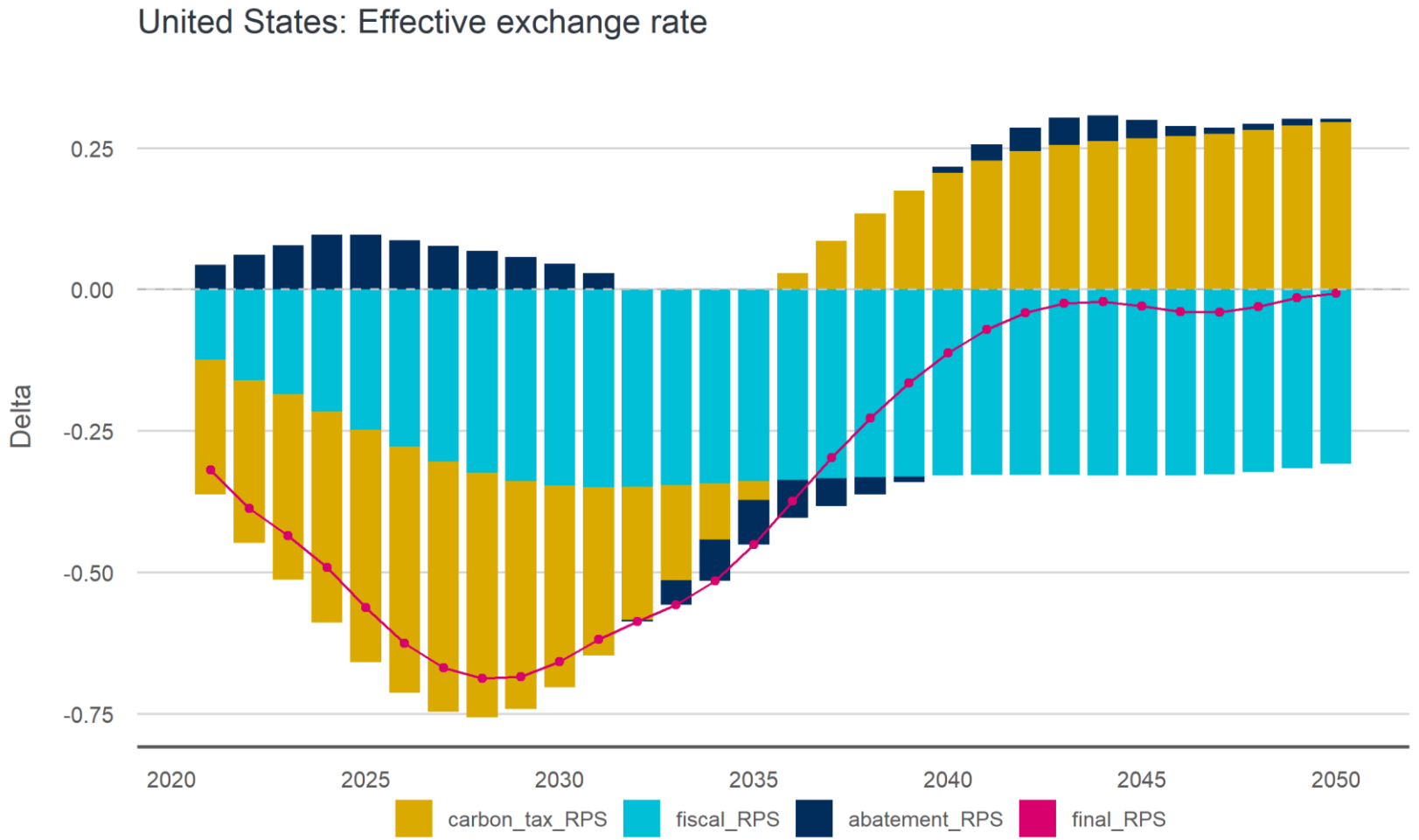
Effective exchange rate cumulative transitional impacts: Global

	2030	2030	2050	2050
	Baseline FX	RPS FX	Baseline FX	RPS FX
Australia	2.8%	3.4%	3.2%	8.8%
Brazil	-19.8%	-20.2%	-20.2%	-42.9%
Canada	0.2%	-2.0%	-1.5%	4.6%
China	4.5%	3.9%	3.9%	9.2%
Central and South America	-4.8%	-4.6%	-4.2%	-9.8%
Eastern Europe	-0.2%	0.3%	0.4%	1.9%
Eurasia	-11.3%	-11.5%	-11.7%	-25.4%
Gulf Cooperation Council	-10.9%	-11.3%	-11.4%	-23.6%
India	-3.7%	-4.1%	-3.1%	-5.6%
Indonesia	4.2%	5.2%	5.7%	10.7%
Japan	7.2%	8.9%	8.0%	12.1%
Middle East and North Africa	-9.1%	-9.6%	-9.3%	-16.6%
Russia	1.4%	1.3%	3.0%	4.5%
South Asia	-11.9%	-12.4%	-12.4%	-25.3%
South Africa	6.1%	5.2%	6.1%	13.6%
South East Asia and Oceania	-5.4%	-5.1%	-5.1%	-9.5%
South Korea	2.2%	3.2%	4.1%	8.1%
Sub Saharan Africa	-10.6%	-10.9%	-11.0%	-23.4%
United Kingdom	-0.8%	-0.3%	-0.6%	2.9%
United States	1.6%	1.2%	1.1%	6.5%
Western Europe	3.5%	3.7%	3.5%	6.0%

INEVITABLE POLICY RESPONSE

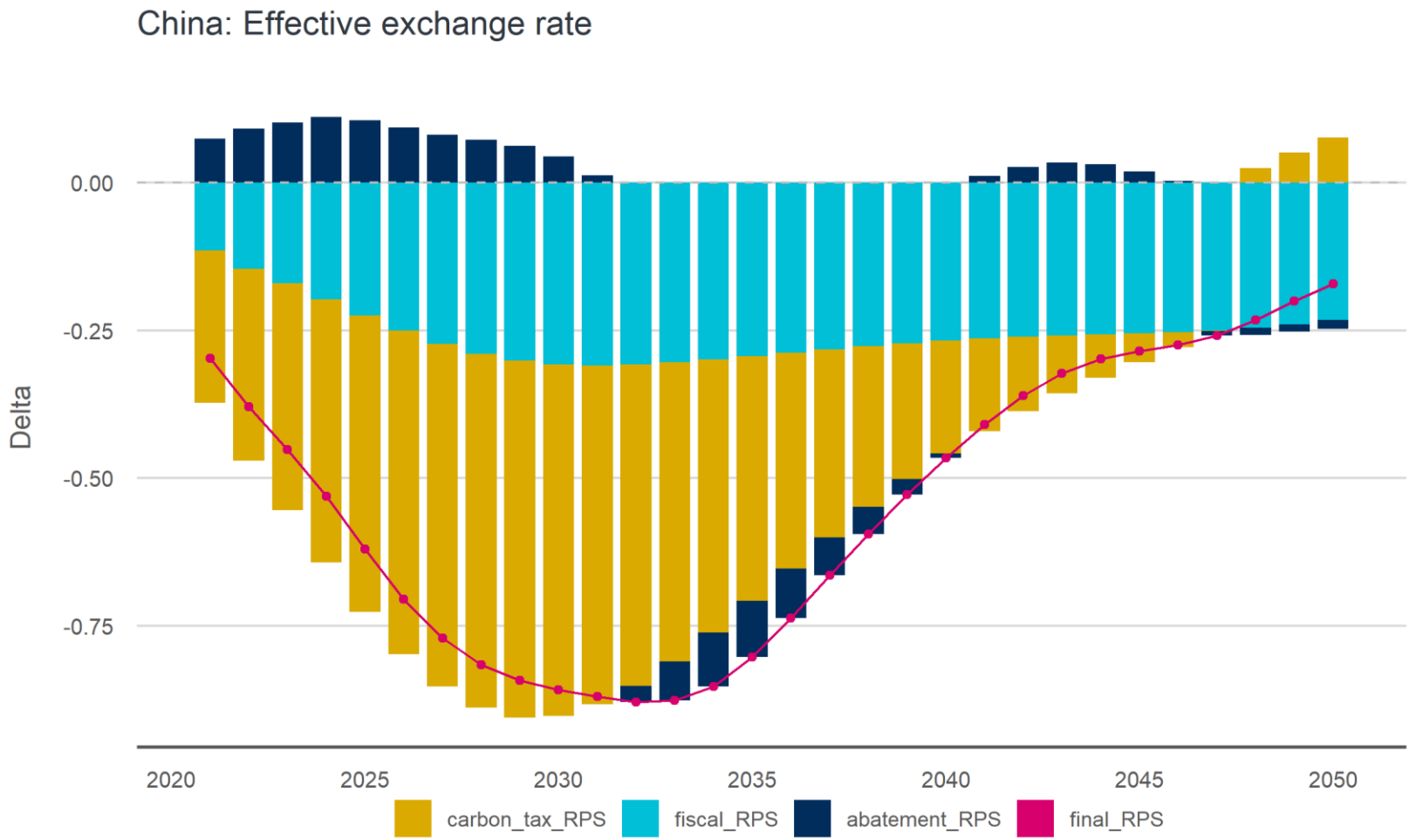
Source: NIGEM based on Vivid Economics inputs. Depreciation in 2020 is calculated as the % change compared to the effective exchange rate value in 2021. In 2050 it is calculated as the % change compared to the effective exchange rate value in 2030.

Effective exchange rate cumulative transitional impacts: United States



Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

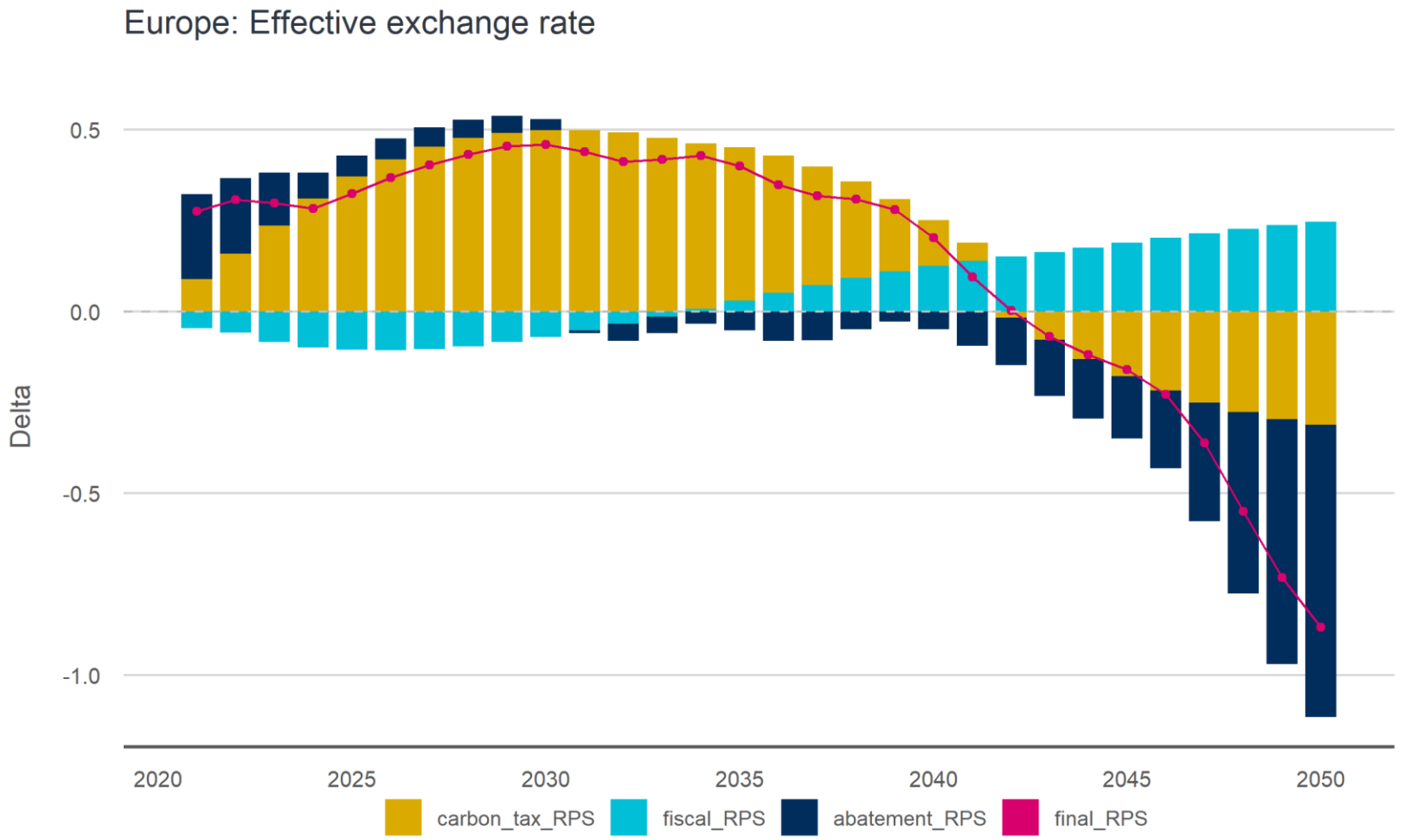
Effective exchange rate cumulative transitional impacts: China



Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Effective exchange rate cumulative transitional impacts: Europe



Note: Delta is calculated as the % difference compared to the baseline scenario; no physical impacts are included in this analysis.
Source: NIGEM based on Vivid Economics inputs.

INEVITABLE POLICY RESPONSE

Thank you!

Please see PRI website for further details:

https://www.unpri.org/climate-change/what-is-the-inevitable-policy-response/4787.article

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INEVITABLE POLICY RESPONSE

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