Summary on climate policies effects on Inflation

1. **THE INFLATION REDUCTION ACT’S INVESTMENTS IN CLEAN ENERGY AND CLIMATE ACTION**

The Inflation Reduction Act is a law that was signed by President Biden in August 2022 with the aim of lowering energy costs for families and small businesses, creating good-paying jobs, and accelerating private investment in clean energy solutions across every sector of the economy and the country. The Act includes $370 billion in investments and prioritizes creating shared prosperity, environmental justice, and resilience for underserved communities, particularly those affected by legacy pollution.

The Act builds on previous climate and clean energy actions taken by the Biden-Harris Administration and the investments secured in the Bipartisan Infrastructure Law[[1]](#footnote-1) signed in November 2021. According to the Department of Energy, the clean energy provisions of both laws could reduce greenhouse gas emissions by more than 1,000 million metric tons of CO2e in 2030, equivalent to the combined annual emissions released from every home in the United States.

Overall, the Inflation Reduction Act represents a significant effort by the Biden administration to tackle the climate crisis while also creating economic opportunities and supporting underserved communities.

1. **EUROPEAN GREEN DEAL “**

The European Green Deal is a comprehensive plan by the European Union to transition to a low-carbon economy and reduce greenhouse gas emissions. It focuses on three key principles: ensuring a secure and affordable energy supply, developing an integrated and digitalized energy market, and prioritizing energy efficiency and renewable sources. The plan aims to build interconnected energy systems, promote innovative technologies and infrastructure, boost energy efficiency, decarbonize the gas sector, empower consumers, promote global energy standards, and develop offshore wind energy. The goal is to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.

1. **FIT FOR 55**

The EU Fit for 55 is a package of legislative proposals presented by the European Commission in July 2021. The main objective of the package is to align EU climate, energy, land use, transport, and taxation policies with the target of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels, as set out in the European Green Deal.

The package includes a range of proposals to achieve this goal, including optimizing and expanding the EU Emissions Trading System (ETS), introducing new legislation on renewable energy and energy efficiency, increasing the use of sustainable biofuels, promoting the uptake of low-emission vehicles, and establishing a Carbon Border Adjustment Mechanism (CBAM) to prevent carbon leakage.

The package also includes proposals to revise the EU Energy Taxation Directive, which aims to align taxation of energy products with EU climate objectives, and to revise the EU's Energy Performance of Buildings Directive to make buildings more energy-efficient and decarbonized.

The Fit for 55 package is a major step towards achieving the EU's ambitious climate goals, and it will require significant effort from EU member states, businesses, and citizens to implement the proposed measures and transition to a low-carbon economy.

1. **Carbon Taxation and Greenflation: Evidence from Europe and Canada, Maximilian Konradt, Beatrice Weder di Mauro**

The paper examines the impact of carbon taxation on inflation in Europe and Canada, and specifically focuses on the phenomenon of "greenflation," which refers to an increase in the general price level due to climate policy measures. The authors use a panel data approach with (OLS) regressions to estimate the effect of carbon taxation on inflation in several European countries and Canada. To ensure the effect is properly identified and to control for potential confounding factors they use the local projections (LP) method by Jorda` (2005) for the main analysis. The authors subject the main results to a number of robustness checks, i.e. panel-VAR models.

The evidence from three waves of carbon taxes - 1) all taxes that came into effect before 2000, 2) 2000 - 2010 and 3) after 2010 - indicates that the most recent tax deployments have had larger inflationary effects: Compared to taxes enacted earlier, taxes enacted since 2000 have a greater effect on prices. Yet, they discover that any inflationary pressure that might materialize manifests mostly in headline CPI inflation rather than core inflation.

Interesting enough is the finding that the response of inflation to a similarly sized carbon tax shock (40 USD carbon tax per tCO2 with 30% coverage of total GHG emissions) is more muted in countries equipped with carbon taxes for a longer time-horizon, that adopted effective recycle tax revenues and have monetary autonomy to react to changing prices.

Overall, the paper contributes to the ongoing debate about the optimal design of environmental policies, particularly carbon taxes, and their potential impact on inflation and economic welfare. The only limits of their conclusions are that they did not consider EU ETS as carbon pricing in their models but only carbon taxes.

1. **Effects of Carbon Pricing on inflation, Richhild Moessner**

This paper contributes to the literature on climate policy consequences on inflation, by providing ex-post empirical analysis of the effects of both carbon taxes and prices of ETS on consumer price inflation and its food, energy and core subcomponents, across 35 OECD economies from 1995 to 2020. In contrast to Konradt and Weder di Mauro (2021) and McKibbin et al. (2021), that only study carbon taxes, this research also considers carbon emissions trading system (ETS) prices. The author uses dynamic panel estimation of New-Keynesian Phillips curves across countries in order to capture inflation dynamics well. The key findings of the article are the following:

1. The impact of carbon pricing on inflation is likely to be small, particularly if the policy is implemented gradually and predictably by informing
2. The effects of carbon pricing on inflation depend on a range of factors, including the degree of pass-through to consumer prices, the level of carbon intensity in different sectors, and the effectiveness of monetary policy in managing inflationary pressures.
3. While there may be some short-term inflationary effects from carbon pricing, the long-term benefits of reducing greenhouse gas emissions through this policy instrument are likely to outweigh these costs.
4. Carbon pricing can potentially have distributional effects, as some households and industries may be more affected than others. Policymakers should take steps to mitigate these impacts and ensure that the burden of reducing greenhouse gas emissions is shared fairly.

Overall, the findings are relevant for future climate policies. They suggest that higher carbon taxes and prices of permits in ETS have not led to large increases in headline inflation, and especially had no significant effects on food CPI and core CPI inflation, consistent Konradt and Weder di Mauro (2021) results. All in all, the use of carbon pricing to accelerate the essential transition to net zero carbon emissions need not be then constrained by considerations about significant overall inflationary implications. This is significant since studies have shown that these carbon pricing schemes reduce carbon emissions (Kohlscheen et al., 2021).

1. **Surging Energy Prices in Europe in the Aftermath of the War: How to Support the Vulnerable and Speed up the Transition Away from Fossil Fuels, IMF, by Anil Ari, Nicolas Arregui, and Oya Celasun et al.**

In this working paper from the International Monetary Fund there are interesting inputs. Above all, in Chapter V the authors discuss about the implications of the energy price surge for climate policy in Europe.

It is crucial to determine whether the planned green transition and concerns about energy security can coexist. These concerns are high on the political agenda in Europe. In the EU Green Deal plan, the EU promised to cut greenhouse gas (GHG) emissions by 55 percent below 1990 levels by 2030. In particular, emissions from industry and power sources covered by the EU ETS would be cut by 61 percent by 2030. (relative to 2005 levels)

For climate mitigation policy, the energy price surge presents both opportunities and risks. The rise in fossil fuel prices would promote incentives to conserve energy and to increase the use of renewables, with a positive effect on emissions reductions. Policy responses to the surge in energy costs should aim to preserve the price signal while providing targeted support. For low-income households, lump-sum cash transfers, vouchers, or fixed discounts on utility bills are appropriate means of providing income support without distorting marginal energy prices, thus conserving the incentive to reduce energy consumption.

As studied by Känzig (2021), who suggest that compensating low-income households that are more exposed to carbon pricing may help to increase the public support of climate change mitigation policies – consistent with recent evidence by Anderson, Marinescu, and Shor (2019).

1. **Climate policies and monetary policies in the euro area, Warwick McKibbin, Maximilian Konradt, Beatrice Weder di Mauro**

The paper examines the interactions between climate policies and monetary policies in the euro area using a global macroeconomic model. It investigates the impact of carbon pricing policies on macroeconomic variables, including inflation, output, and interest rates, and analyzes the trade-offs and synergies between climate and monetary policies. The authors conclude that the introduction of carbon pricing in the euro area can have significant macroeconomic effects and suggest that policymakers should carefully consider the design of such policies to maximize their benefits and minimize potential negative impacts. Here below the main findings in a nutshell:

1. Carbon pricing policies have a significant impact on macroeconomic variables, including inflation, output, and interest rates. The authors find that carbon pricing policies can lead to higher inflation in the short run, but this effect diminishes over time. They also find that carbon pricing policies can have a negative impact on output, but this effect is mitigated by the use of revenue-neutral recycling mechanisms, such as rebates or tax cuts.
2. There are trade-offs and synergies between climate and monetary policies. The authors find that the introduction of carbon pricing policies can lead to higher interest rates in the short run, as central banks respond to the higher inflationary pressures. However, over the long run, carbon pricing policies can lead to lower interest rates, as they reduce the demand for fossil fuels and promote investment in clean energy.
3. The design of carbon pricing policies is crucial for their effectiveness and their impact on the economy. The authors find that revenue-neutral recycling mechanisms, such as rebates or tax cuts, can mitigate the negative impact of carbon pricing policies on output and ensure that the policies are politically feasible. They also find that a gradual and predictable increase in carbon prices is important for promoting investment in clean energy and reducing uncertainty for businesses.

**Introduction**

The climate crisis has been one of the most pressing issues facing humanity in recent years, not only for the physical risk arising from chronic and acute climate events, but also because it has significant implications for the global economy. To avoid warming of the global average temperature exceeding 1.5 C, evidence gathered by the Intergovernmental Panel on Climate Change suggests that decreasing net carbon emissions to zero by mid-century is likely to be necessary (IPCC, 2018). Moreover, in the long-run, financial institutions and society at large may face significant financial losses due to the effects of climate change, FINMA (2020). As such, the implementation of climate policies has become a priority for many countries worldwide, the EU’s fit for 55, The Inflation Reduction Act, China 13th Five-Year Plan, are examples of such policies, from Europe, United States and China, respectively. Albeit the growing implementation of such low-carbon emission policies, constructed through carbon pricing schemes i.e. carbon tax and cap-and-trade systems, the literature on their economic implications is not yet abundant as it ought to be.

Cap-and-trade schemes begin by setting a limit on pollution, followed by the issuance of a volume of emission allowances that align with the cap, enabling companies to determine a market-clearing price by buying and selling allowances. Conversely, a carbon tax involves policymakers setting a price directly on CO2 emissions, allowing the market to determine the amount of pollution that is consistent with that price. Consequently, carbon taxes are anticipated to result in more consistent carbon prices, whereas cap-and-trade systems often exhibit significant price fluctuations (Goulder and Schein, 2013; Metcalf, 2021). On carbon taxes, for a considerable amount of time, economists have contended that implementing Piguouvian-style carbon taxes is the most effective approach to combat climate change. Earlier research has revealed that carbon taxes are successful in reducing emissions, with examples including Murray and Rivers (2015) study on Canada, as well as Andersson (2019), Martin, De Preux, and Wagner (2014), Lin and Li (2011), and Best, Burke, and Jotzo (2020) research on Europe. The work of Rafaty, Dolphin, and Pretis (2020) survey this literature.

Inflation “is here to stay” as Ralph Hamers former CEO of UBS stated at WEF (2022) and confirmed by central banks’ tightening monetary policy, therefore this macroeconomic indicator is gaining momentum now and, in the years, to come. Today more than ever substantial evidence is requested by market participants and taxpayers about the effects of climate policies i.e. carbon taxes and ETS.

In the spirit of Moessner (2022), I contribute to this literature by expanding and tweaking his empirical methodology, whereby instead of New-Keynesian Phillips curve I opt for a panel-VAR technique Canova and Ciccarelli (2013) approach, a workhorse model in empirical macroeconomics (e.g., Sims 1980; Christiano et al. 2005; Beaudry and Portier 2006; Brunnermeier et al. 2021a). Panel-VAR method has been used for similar purposes by Konradt and Weder di Mauro (2021). This type of VAR method, which was pioneered by Sims (1980) and suggested by Auerbach and Gorodnichenko (2012) is a prominent time series model utilized to comprehend and forecast economic impacts and ramifications from monetary and fiscal policy shocks as well as other non-policy shocks like climate and technology shocks.

**Related literature**

There is still little definitive research on the economic impacts of carbon pricing and climate policies aimed at shifting the society toward net-zero emissions status. Most of the literature is centered on ex-ante (model-based) evaluations. On the other hand, less is known on the ex-post (estimated) economic impact of carbon pricing, an increasing body of research has recently addressed the study of its effect on economic growth (Metcalf and Stock, 2020), industrial and business performance, competitiveness and innovation (Shapiro and Metcalf, 2021; Venmans et al., 2020; Martin et al., 2014, 2016), employment (Martin et al., 2014; Yamazaki, 2017), international trade (Mundaca et al., 2021) and the inequality of income distribution (Elkins and Baker, 2001; Känzig, 2021).

Existing studies describe carbon pricing as a stark enabler to achieve GHG reduction objectives in the short-run and long-run, but simultaneously instant upwards pressure on energy prices kicks in (Känzig, 2021). The latter is a costly countereffect of carbon policy, that has pass-through property, whereby consumer and producer prices rise significantly and economic activity falls, which is mirrored in higher inflation, lower output and higher unemployment. However, as other studies infer, the fall in GHG emissions is more persistent than the non-lasting fall in economic activity (Kohlscheen et al., 2021; Konradt and Weder di Mauro, 2021; McKibbin et al.,2021). In line with this, if no mitigating actions are taken towards GHG emissions’ reductions, then the expected global GDP will shrink by 18% by 2050 reveals Swiss Re Institute's stress-test analysis (2021). I add to this body of literature by offering updated inflation impact estimates based on the EU ETS the biggest carbon market in the world, EU carbon tax, and the California Cap-and-Trade Program similarly to (Moessner, 2022; Kohlscheen et al., 2021). Today more than ever substantial evidence is requested by market participants and taxpayers about the effects of climate policies i.e. carbon taxes and ETS.

McKibbin et al. (2014) conducted a study on the potential impact of carbon tax implementation in the United States. They found that it would likely have positive but temporary effects on inflation, based on their model-based evaluations. A recent study by Konradt and Weder di Mauro (2021) looked at the actual impacts of carbon taxes in Europe and Canada on inflation, and found that they were not inflationary, and may have even been deflationary. They suggest that any inflationary pressures observed were likely limited to the headline component, and did not affect core inflation, which can be explained by the fact that carbon taxes mainly affect the prices of energy and not the prices of other goods and services. In a more recent study focused on the euro area, McKibbin et al. (2021) found that carbon taxes do have a positive impact on inflation, especially in the first few years after implementation, but the effect fades over the medium to long-term.

Additionally, carbon taxes are found to have a negative impact on core inflation, further supporting the idea that they affect inflation through changes in relative prices rather than overall price levels. Känzig (2021) used high-frequency data and institutional features of the European carbon market to study the impact of carbon pricing on energy and consumer prices. The results showed that carbon policy shocks accounted for around one third of the variations in energy prices within the EU ETS. In another study by Moessner (2022) which analyzed the effects of carbon pricing on OECD countries, both carbon taxes and ETS prices were considered. The findings revealed that an increase in ETS prices had an inflationary effect, but only on energy CPI inflation, and this effect faded away within two years. Interestingly, an increase in carbon taxes led to a rise in food CPI inflation only, and did not have any significant effects on other components.

However, the impact of carbon pricing on inflation remains uncertain and is a matter of additional empirical investigation, despite a growing number of recent studies conducted on the subject. Existing research on the effects of climate change and climate policies on macroeconomic variables has primarily centered on their impact on output and unemployment (Metcalf and Stock, 2020a; Metcalf and Stock, 2020b)

In a nutshell, this thesis makes a contribution to the existing literature by conducting an ex-post empirical analysis of the impact of both carbon taxes and prices of EU ETS on consumer price inflation, as well as its subcomponents of food, energy, and core inflation, using a broad sample of EU OECD countries. The approach differs from that of Konradt and Weder di Mauro (2021) and McKibbin et al. (2021), who only focus on carbon taxes, as I also include ETS system. Additionally, unlike Känzig (2021), who only examines surprises in ETS prices, I also consider carbon taxes. With respect to the empirical specifications for inflation, which incorporate carbon taxes, lagged inflation, fixed effects, I added the EU ETS, Switzerland ETS, the California Cap-and-Trade program, brent oil price, inflation expectations, NEER and policy interest rates (Konradt and Weder di Mauro, 2021; McKibbin et al., 2021). Furthermore, in terms of coverage the analysis encompasses a range of countries limited to major EU-27 countries, the US and Switzerland differently from Konradt and Weder di Mauro (2021) that only considers Europe and Canada. However, this is trivial since Euro area inflation has been very strongly correlated with inflation in the countries of the Organisation for Economic Co-operation and Development (OECD) with two exceptions: from 1999 to 2002, when there was a period of low inflation following the introduction of the euro; and, to a lesser extent, between 2014 and 2015, ECB Bulletin (2017)

The rationale behind selecting both carbon pricing schemes for the research is to show which of the two has the greatest impact on inflation and its subcomponents, and therefore pointing out to policymakers the best approach to follow in order to align with the central bank’s utmost objective of price stability Alex Cukierman (1994), allowing this thesis to bridge a significant gap from the relevant literature

Concerning the control variables, the literature has localized multiple domestic and global factors as affecting inflation Borio and Filardo (2007). First, in relation to the domestic factors, the wages, inflation expectations and producer prices among others. For instance, the pass-through occurring when wages increase more strongly than productivity, they push up unit labor costs and thereby increase cost pressures for firms, which may then feed through to producer prices and, ultimately, consumer prices, ECB Economic Bulletin (2017). Second, with respect to global factors, the nominal effective exchange rate indices (broad indices, annual averages) has been selected, with an increase indicating an appreciation of the domestic currency. In addition to this, global driver of inflation is commodity price, therefore I opt for Brent oil prices (annual averages, US dollar per barrel) as a proxy. Conclusively, a subset of the literature has established that global factors, and in particular international commodity prices, increasingly explain inflation dynamics rather than domestic circumstances. (Fernandez et al., 2017; Parker, 2018; Kamber and Wong, 2020).

**Theoretical Background**

This sub-subsection is dedicated to further examine the current climate policies implemented across major emitting countries e.g. China, the EU, India, Russia and the U.S., (Statista, 2021) in order to give a clear picture and broad context of the research question. Such policies include carbon taxes and emissions trading systems (ETS), but also broader changes in regulation (Stern, 2007, 2008). The first carbon tax was introduced in Finland in 1990. In turn, emissions trading has been considered a possible tool for mitigating GHG emissions since the early 1990s and formed a key part of the Kyoto Protocol agreement (Philibert and Reinaud, 2004). The database incorporates information on carbon taxes and ETS implemented at the national and supranational levels since 1990 from the World Bank (World Bank, 2021).

Governments establish the cost of carbon emissions in carbon tax situations, leaving it up to private entities to decide on emission reductions. There are two primary kinds of Emissions Trading Schemes (ETS): cap-and-trade and baseline-and-credit. In the case of cap-and-trade ETS, a cap is set on emissions by governments, and allowances up to this threshold are either sold or allocated based on specific criteria. These licenses are subsequently exchanged, with carbon prices being determined by the market's supply and demand. In contrast, for baseline-and-credit ETS, emission baselines are established for regulated emitters. Emitters whose emissions go beyond their designated baseline must forfeit credits to compensate for these emissions, while those whose emissions fall beneath their baseline are awarded credits for these reductions, which they can sell to other emitters (World Bank, 2021).

As next the main climate policy actions taken by major polluters in alphabetical order. The 13th Five-Year Plan[[2]](#footnote-2) lays down the strategy and pathway for China’s development for 2016-2020 and includes concrete environmental and efficiency targets. This plan has established targets for reducing carbon emissions, energy consumption, and water usage, while also aiming to enhance the efficiency of industries and eliminate obsolete or surplus production facilities. It also seeks to increase the usage of renewable energy and develop eco-friendly infrastructure. 2021 signs the beginning of China’s 14th Five-Year Plan, built on the achievements of the 13th FYP it aims to decrease the carbon intensity of the economy, enhance high-quality green development and peak CO2 emissions before 2030 (Asian development bank, 2021). The previous 11th Five Year Plan had experimented with energy intensity targets in certain pilot projects, while the 12th Five Year Plan had focused on promoting sustainable and socially inclusive economic growth. As of April 2022, China national ETS price rate is 9.20$ per tCO2e, covering 4.50 GtCO2e i.e. 8.79% of global GHG emissions (carbon pricing dashboard, Worldbank).

In Europe, the Fit for 55, part of the large scale European Green Deal, is the major package of actions taken towards GHG emissions reduction. The European Green Deal is a comprehensive plan by the European Union to transition to a low-carbon economy and reduce GHG emissions. It focuses on three key principles: ensuring a secure and affordable energy supply, developing an integrated and digitalized energy market, and prioritizing energy efficiency and renewable sources. The plan aims to build interconnected energy systems, promote innovative technologies and infrastructure, boost energy efficiency, decarbonize the gas sector, empower consumers, promote global energy standards, and develop offshore wind energy. The goal is to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. The EU Fit for 55 is a package of legislative proposals presented by the European Commission in July 2021. The main objective of the package is to align EU climate, energy, land use, transport, and taxation policies with the target of reducing net GHG emissions by at least 55% by 2030 compared to 1990 levels, as set out in the European Green Deal he package includes a range of proposals to achieve this goal, including optimizing and expanding the EU Emissions Trading System (ETS), introducing new legislation on renewable energy and energy efficiency, increasing the use of sustainable biofuels, promoting the uptake of low-emission vehicles, and establishing a Carbon Border Adjustment Mechanism (CBAM) to prevent carbon leakage. The package also includes proposals to revise the EU Energy Taxation Directive, which aims to align taxation of energy products with EU climate objectives, and to revise the EU's Energy Performance of Buildings Directive to make buildings more energy-efficient and decarbonized. The Fit for 55 package is a major step towards achieving the EU's ambitious climate goals, and it will require significant effort from EU member states, businesses, and citizens to implement the proposed measures and transition to a low-carbon economy. As of April 2022, EU ETS price rate is 86.53$ per tCO2e, covering 1.63 GtCO2e i.e. 3.18% of global GHG emissions (carbon pricing dashboard, Worldbank).

Although India is the world’s third-largest emitter of CO2, it does not levy an explicit carbon price nor has any ETS already implemented. However, since 2018, 54.7% of GHG emissions are subject to a positive Net Effective Carbon Rate (ECR) unchanged until 2021.

The Russian Federation does not levy an explicit carbon price nor has any ETS already implemented. However, fuel excise taxes, an implicit form of carbon pricing, cover 13.7% of CO2 emissions in 2021, unchanged since 2018.

In the United States there is not yet a national ETS or carbon tax into place, however some states are taking actions towards climate neutrality, being the state of California the leader in this regard. Namely, the California Cap-and-Trade Program began operation in 2012 and it covers about 75% of the state’s GHG emissions. As of April 2022, CaT price rate is 30.82$ per tCO2e, covering 0.31 GtCO2e i.e. 0.6% of global GHG emissions (carbon pricing dashboard, Worldbank).

On the eastern coast of US, in 2009 twelve states i.e. New York, Virginia, Vermont among others, initiated The Regional Greenhouse Gas Initiative (RGGI). The latter is a cooperative effort to cap and reduce CO2 emissions from the power sector. Under the RGGI program, power plants with a capacity of 25 megawatts or more are required to purchase allowances for each tCO2 they emit. As of April 2022, RGGI price rate is 13.89$ per tCO2e, covering 0.07 GtCO2e i.e. 0.13% of global GHG emissions (carbon pricing dashboard, W

orldbank). It is predicted to increase, as the total number of allowances available are declining. The proceeds from the sale of permits are invested in renewable clean energy and energy efficiency programs. It represents the first cap-and-invest regional initiative implemented in the United States.

At the national level, The Inflation Reduction Act (IRA) is a breakthrough law that was signed by President Biden in August 2022 with the aim of lowering energy costs for families and small businesses, creating good-paying jobs, and accelerating private investment in clean energy solutions across every sector of the economy and the country. The Act includes $370 billion in investments and prioritizes creating shared prosperity, environmental justice, and resilience for underserved communities, particularly those affected by legacy pollution. The Act builds on previous climate and clean energy actions taken by the Biden-Harris Administration and the investments secured in the Bipartisan Infrastructure Law[[3]](#footnote-3) signed in November 2021. According to the Department of Energy, the clean energy provisions of both laws could reduce greenhouse gas emissions by more than 1,000 million metric tons of CO2e in 2030, equivalent to the combined annual emissions released from every home in the United States. Overall, the Inflation Reduction Act represents a significant effort by the Biden administration to tackle the climate crisis while also creating economic opportunities, attracting new foreign green investments and supporting underserved communities.

Table 1 contains an overview of the main climate policies and green plans in place with the main commonalities and differences highlighted.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Price Rate ($/tCO2) | Coverage of global GHG emissions | National coverage | Planned sustainable investments |
| China 14th FYP | 9.20 | 8.79% | Yes | Not disclosed |
| European Green Deal | 86.53 | 3.18% | Yes | €1 trillion[[4]](#footnote-4) |
| India | - | - | - | - |
| Russian Federation | - | - | - | - |
| US - California CaT program | 30.82 | 0.6% | No | $370 billion (The Inflation Reduction Act) |
| US - RGGI | 13.89 | 0.13% | No | $370 billion (The Inflation Reduction Act) |

**Implications of climate policy on inflation**

The NGFS shows that the eventual impact of climate policy depends on fiscal policy assumptions and the applied monetary policy. According to the different fiscal revenue recycling options from carbon tax, the NGFS analyzed the effects of a reference “shock” i.e. increase in carbon price and four additional fiscal shocks, to inflation rate, GDP, short- and long-term interest rate. In their sensitivity analysis four fiscal policy options are selected, where 100% of carbon tax revenues are utilized to finance each of them: 1) an increase in public investment, 2) a cut in taxes applied to private sector agents, 3) an increase in transfers to households, 4) the reimbursement of public debt.

Overall, they found that there are limited differences across recycling options. The shock triggers positive effects on inflation in the short term. However, the monetary policy reaction differs according to the fiscal policy choice underlying that the need for macroeconomic stabilization is somehow differentiated. Among the fiscal instruments considered, government investments has the strongest output multiplier as it directly affects final expenditures. As a result, in the short term, the inflationary impact from increased public investment is the strongest, with a 4 percentage point increase from baseline. All the other options lead to a rise in inflation (around 3 p.p.) but, in all cases, inflation returns to baseline within a 5-year period following the carbon price increase (NGFS, climate scenarios sensitivity analysis to macroeconomic policy assumptions, 2022).

In a second step, they analyzed the sensitivity of the scenario results to monetary policy assumptions, by utilizing the same settings. They first consider that the policy interest rate is kept at its baseline level for the first 5 years of the scenario. For most countries, the 2-pillar monetary policy rule - the conventional rule in NiGEM[[5]](#footnote-5) - is assumed. The nominal GDP target to nominal GDP ratio and the difference between inflation expectations and the inflation target determine the short-term interest rate under the two-pillar strategy. Fiscal shocks and the price of carbon share the same MP context. Similarly, as the fiscal policy assumption analysis, they noticed an increase in inflation in the short-term, but within 5-year period it returns to baseline.

1. $1.2 trillion bipartisan agreement that aims to invest in and modernize United States’ infrastructure. The law includes funding for a wide range of infrastructure projects, such as repairing roads and bridges, expanding power grid, upgrading public transportation systems, improving water infrastructure, and investing in clean energy technology. It is intended to create new jobs and promote economic growth while addressing some of the country's critical infrastructure needs. [↑](#footnote-ref-1)
2. “..China in its development efforts, proactively adapt to, understand, and guide the new normal in economic development, and comprehensively advance innovative, coordinated, green, open, and shared development so as to ensure that a moderately prosperous society is established in all respects.…” https://en.ndrc.gov.cn/policies/202105/P020210527785800103339.pdf [↑](#footnote-ref-2)
3. $1.2 trillion bipartisan agreement that aims to invest in and modernize United States’ infrastructure. The law includes funding for a wide range of infrastructure projects, such as repairing roads and bridges, expanding power grid, upgrading public transportation systems, improving water infrastructure, and investing in clean energy technology. It is intended to create new jobs and promote economic growth while addressing some of the country's critical infrastructure needs. [↑](#footnote-ref-3)
4. https://ec.europa.eu/commission/presscorner/detail/en/qanda\_20\_24 [↑](#footnote-ref-4)
5. NiGEM is the leading global macroeconomic model, used by both policymakers and private sector organisations across the globe for economic forecasting, scenario building and stress testing. (NGFS, Climate Scenarios Database, Technical Documentation V2.2, June 2021) [↑](#footnote-ref-5)