

## Winners and losers from the new (third) Swiss CO<sub>2</sub> law

- In September 2020, the Swiss Parliament adopted new revisions to the CO<sub>2</sub> law. On 13 June 2021, Swiss citizens will vote on whether to accept the new provisions.
- Switzerland targets reducing net greenhouse gas emissions by at least 50% by 2030 compared to 1990 levels.<sup>1</sup> The new CO<sub>2</sub> law identifies specific measures for achieving the climate target.
- The proposed changes could have far reaching impacts on Swiss energy security, competitiveness and social well-being. Table 1 highlights the potential winners and losers associated with the proposed policy changes.

Table 1: Winners and losers from the new (third) Swiss CO<sub>2</sub> law

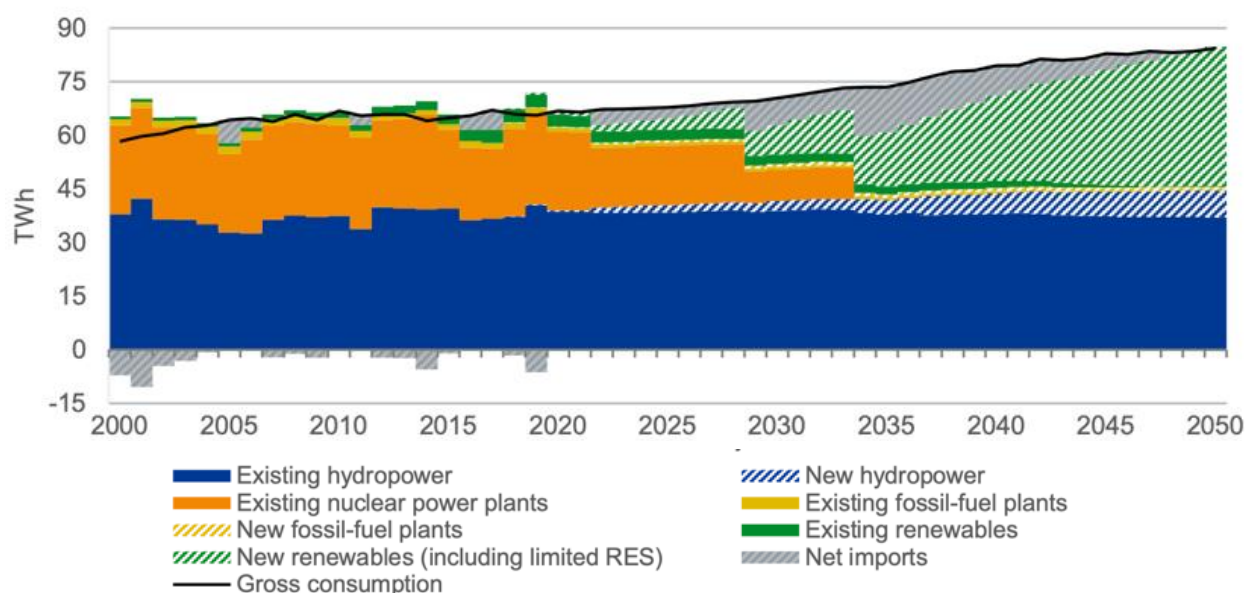
Description	Impacts
The new CO <sub>2</sub> law will require 75% of emission reductions to be generated domestically in Switzerland. Achieving the emission reductions principally through domestic emission caps, while at the same time phasing-out nuclear energy, will deteriorate Swiss energy security and erode electricity supply reliability. Cost of electricity is also expected to increase significantly.	<p>Winners:</p> <ul style="list-style-type: none"> <li>- Producers of electricity and energy intensive products abroad</li> <li>- Renewable energy services in Switzerland</li> </ul> <p>Losers:</p> <ul style="list-style-type: none"> <li>- Swiss energy security, nuclear energy producers and large users of electricity</li> <li>- Swiss consumers, business, competitiveness</li> </ul>
The new CO <sub>2</sub> law envisions introducing an air passenger departure tax of between CHF 30 and CHF 120 depending on distance and class of travel. This policy will significantly increase the cost of air travel from Switzerland.	<p>Winners:</p> <ul style="list-style-type: none"> <li>- Travel destinations abroad</li> </ul> <p>Losers:</p> <ul style="list-style-type: none"> <li>- Tourism and travel dependent sectors in Switzerland (airlines, hotels, restaurants, etc.)</li> <li>- Swiss consumers, business, competitiveness</li> </ul>
Part of the revenue will be spent through a Climate Fund. Except for investments in buildings and new technologies, it is unclear whether activities supported by the fund will generate more benefits than they cost.	<p>Winners:</p> <ul style="list-style-type: none"> <li>- Unknown (climate fund beneficiaries)</li> </ul> <p>Losers:</p> <ul style="list-style-type: none"> <li>- Swiss consumers, business, competitiveness</li> </ul>
Part of the revenue will be distributed to the population and economic actors. The proportion that is distributed directly to the population will be an equal amount per inhabitant, which means the distribution is untargeted.	<p>Winners:</p> <ul style="list-style-type: none"> <li>- Urban residents are likely to benefit due to a lower carbon footprint</li> </ul> <p>Losers:</p> <ul style="list-style-type: none"> <li>- Rural residents are likely to bear more of the cost due to a higher carbon footprint</li> </ul>
The new CO <sub>2</sub> law does not specify how international finance flows will be aligned with the Paris Agreement. Despite being one of the global financial nodes, Switzerland has yet to develop a policy on aligning finance flows with international climate policy commitments.	<p>Winners:</p> <ul style="list-style-type: none"> <li>- Carbon intensive businesses abroad, including fossil fuel producers</li> </ul> <p>Losers:</p> <ul style="list-style-type: none"> <li>- Investors exposed to transitory and physical risks of climate change</li> </ul>

<sup>1</sup> [Switzerland's updated and enhanced nationally determined contribution](#) under the Paris Agreement, 2020.

## Swiss energy security will deteriorate due to combined impact of stringent domestic emission caps and phase-out of nuclear energy

- Demand for electricity in Switzerland is expected to grow. Electricity demand in Switzerland in 2050, in comparison to 2019, will increase by 45% according to modeling of the base case net-zero emissions scenario under the Swiss Energy Strategy 2050. Demand is forecast to increase from about 58 terawatt hours in 2019 to about 84 terawatt hours in 2050.<sup>2</sup> These estimates take into account ambitious energy saving and demand side management programs as well as deployment of electric vehicles in road transport.
- Supply of electricity produced in Switzerland is expected to shrink in the short to medium term due to planned phase-out of nuclear power plants. Supply of electricity is currently met largely through hydro (55%) and nuclear (36%). Other sources such as thermal, conventional and renewables taken together make up less than 10% of electricity supply.<sup>3</sup>
- In most years, over the past two decades, Switzerland has been a net exporter of electricity. However, due to the planned phase-out of nuclear energy and increasing electricity demand, Switzerland is expected to become a net electricity importer.
- For the next 25 years, renewable energy is not expected to meet growing electricity demand. Furthermore, it may take 20 years or more for renewable energy to make-up for the nuclear energy shortfall (See Figure 1).

Figure 1: Switzerland will become structurally dependent on foreign electricity



Source: Excerpt from [Switzerland's Long-Term Climate Strategy](#), Prognos SA/TEP Energy Sàrl/ INFRAS SA 2020.

- In addition, the removal of nuclear energy from the electricity production mix is expected to accentuate the seasonal imbalances between electricity demand and production in Switzerland. Modeling carried out for the Swiss Energy Strategy 2050 estimates that after the expected decommissioning of the Leibstadt nuclear facility, the dependence on electricity imports in the winter season will reach up to about 40% in 2034.<sup>4</sup> For Switzerland, this represents an unprecedented level of dependence on foreign electricity sources.
- Relying on imported electricity, will not increase emissions in Switzerland but will still result in higher global emissions overall. Therefore, using imported electricity from “dirtier” grids will do little to address climate change.

<sup>2</sup> Office fédéral de l'énergie, 2020, Résumé des Principaux Résultats, [Perspectives Énergétiques 2050+](#), p.30.

<sup>3</sup> Office fédéral de l'énergie, 2020, [Swiss electricity statistics](#).

<sup>4</sup> Office fédéral de l'énergie, 2020, Résumé des Principaux Résultats, [Perspectives Énergétiques 2050+](#), p.22.

## Policy options for Switzerland to reduce future dependance on foreign electricity

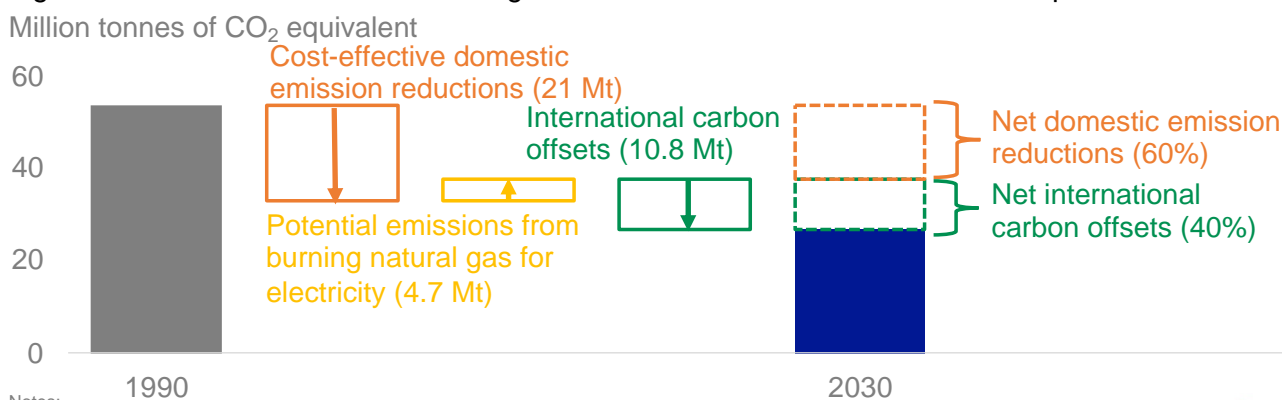
### Option 1: Revisit the role of nuclear energy

- The latest nuclear energy generators (GEN III) have an unparalleled focus on safety, far better than that of any other energy source. Even in the case of catastrophic events such as seismic activity, natural disaster and direct aircraft crash the probability of external radioactivity release is minimal. Even when considering all possible technological, natural and man-induced events, the probability of radioactive leakage is estimated at less than 1 in 10 million per year (1E-7/yr).<sup>5</sup>
- These safety improvements have increased construction costs for new reactors, bringing electricity generation costs broadly on par with advanced conventional energy sources, such as combined cycle natural gas turbines.<sup>6</sup> However, nuclear energy has the added advantage of generating electricity without producing greenhouse gas emissions during operation.
- Extending the operating life of existing nuclear plants and building new (GEN III or IV) reactors offers an approach through which Switzerland can meet its electricity demand without increasing its greenhouse gas emission while avoiding becoming overly dependent on foreign electricity.

### Option 2: Deploy conventional energy (natural gas)

- Switzerland can reduce its dependance on electricity imports in the winter season by investing in highly efficient conventional power generation domestically such as combined cycle gas turbine technology. This should also help reduce overall global greenhouse gas emissions since the imported electricity would mostly be produced from either burning lignite, coal or natural gas – the marginal power generation sources in winter in Western Europe.
- Until cost-effective carbon capture and storage technology is developed, international carbon credits can be used to meet the Swiss climate targets,<sup>7</sup> including reducing 2030 net greenhouse gas emissions by at least 50% compared to 1990 levels. The target could be achieved by using international carbon credits to offset emissions associated with electricity generation from natural gas. However, the proposed (third) CO<sub>2</sub> law over relies on net domestic emission reductions. Instead, the exiting approach of 60% reductions domestically and 40% internationally would be more cost-effective and would achieve the same or better global climate benefits (See Figure 2).
- To better manage emissions from natural gas in the long-term, Switzerland can invest in research and development of cost-effective approaches for carbon capture, use and storage, which also has potential application in commercializing advanced alternative fuels. From an energy security perspective, Switzerland may also need to consider diversifying upstream sources of natural gas supply. For example, through participating in consortia that create new energy corridors for brining natural gas to continental Europe, such as [white-stream](#) pipeline that envisions bringing natural gas from the Caspian region (see [analysis on Southern Gas Corridor](#)).

Figure 2: International offsets can safeguard cost-effectiveness of Swiss climate policies



Notes:

1. Cost-effective emission reductions are estimated based on McKinsey & Co. analysis of marginal abatement costs in Switzerland in 2030, not including nuclear power and oil price of \$100, based on mesures below CHF 151 per tonne of carbon dioxide equivalent.

2. Potential emissions from burning natural gas for electricity are based on combined cycle technology, without carbon capture and storage.

Source: Veritas Global using the National Determined Contribution of Switzerland (2020) and McKinsey & Co. Swiss Greenhouse Gas Abatement Cost Curve (2009).



<sup>5</sup> ENCO, 2020, [Possible Role of Nuclear in the Dutch Energy Mix in the Future](#) (p. 41).

<sup>6</sup> ENCO, 2020, [Possible Role of Nuclear in the Dutch Energy Mix in the Future](#) (p. 44).

<sup>7</sup> Federal Office for the Environment, 2020, [Switzerland's Fourth Biennial Report](#) (p. 46).

### **Air connectivity will worsen, leading to less tourism and erosion of Swiss competitiveness**

- The proposed CO<sub>2</sub> law envisions introducing an air passenger departure tax of between CHF 30 and CHF 120 depending on distance and class of travel. The impact on the travel and tourism industry is particularly difficult to assess given the COVID-19 pandemic and lingering effects.
- For some travel markets the tax increase could translate to higher travel costs of 10% or more, which may lead to lower air passenger numbers of between 7% and 14% on those markets.<sup>8</sup>
- The announcement by Swiss International Air Lines to reduce its fleet by 10 short-haul and 5 long-haul aircraft corresponds to 3.1 million less passengers per year served by the airline.<sup>9</sup>
- Therefore, even if the sanitary situation improves, the higher cost burden due to the proposed tax, combined with less air connectivity, may imply that it takes years for the Swiss travel and tourism sector to recover to 2019 levels. Under such conditions, revenues and employment will remain subdued in the sector for some time to come.
- The lower air connectivity will reduce the attractiveness of Switzerland as a business location. Swiss consumers will also be worse-off due to higher airfares and inferior air connections.

### **Spending and distribution of new revenue is not consistent with international best practice**

- Part of the revenue raised is envisioned to be spent through a Climate Fund. About one third of the revenue from the CO<sub>2</sub> tax on heating and process fuels and about half the revenue from the air passenger tax is expected to flow to the Climate Fund.
- Except for investments in buildings and new technologies, it is unclear whether activities supported by the fund will generate more benefits than they cost. A transparent and robust system of cost-benefit analysis is essential for ensuring that resources are deployed where they are needed the most and that they create more benefits than they cost to raise.
- Part of the revenue will be distributed to economic actors and the population. About two thirds of the revenue from the CO<sub>2</sub> tax on heating and process fuels and about half the revenue from the air passenger tax is expected to be redistributed.
- The proportion that is distributed directly to the population will be an equal amount per inhabitant. While an equal distribution per inhabitant may have intuitive appeal, such untargeted spending is not aligned with international best practice policies of the OECD<sup>10</sup> and the IMF.<sup>11</sup> Targeted spending that addresses specific societal priorities, market failures or improves productivity is generally considered to be a more efficient use of resources.
- In Switzerland, rural residents have a direct carbon footprint that is about 64% higher compared to city dwellers.<sup>12</sup> Therefore, the average rural resident is likely to incur higher costs from the new CO<sub>2</sub> law compared to urban residents. Since the revenues are planned to be distributed equally across all residents, rural residents are likely to be made worse-off.

### **Lack of clarity on aligning international finance flows from Switzerland with Paris Agreement**

- One of the commitments under the Paris Agreement is to align international financial flows with the Paris Agreement. Multilateral and regional development banks have developed a joint framework for [aligning operations, activities and decision making with the Paris Agreement](#).
- The lack of policy clarity makes it easier for unsustainable businesses to secure finance from funds managed in Switzerland. At the same time, the lack of transparency and standardized framework in which to analyze potential transitory and physical risks related to climate change makes it difficult for investors to coherently assess exposure to these risks.

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<sup>8</sup> InterVISTAS, 2007, [Estimating Air Travel Demand Elasticities](#).

<sup>9</sup> Swissinfo.ch, 6 May 2021, [SWISS to lay off up to 780 staff and reduce fleet](#).

<sup>10</sup> OECD, July 2018, [Tax Policies for Inclusive Growth in a Changing World](#).

<sup>11</sup> IMF, Finance & Development, March 2018, [Spreading the Wealth](#).

<sup>12</sup> Melissa Pang et al, 2020, Environ. Res. Commun., [Urban carbon footprints for Swiss households](#).