Insights from the workshop held on 01.06.22

Insights regarding key decarbonisation policies from the stakeholder workshop hosted by the Paul Scherrer Institute and the Techno-economic of Energy Systems laboratory (TEESlab) on the **1st of June 2022** are synthesised in the following sections. These insights are used for the research and energy modelling exercise performed in POLIZERO and to inform the JRC-EU-TIMES and AIM models. To this end, these insights are summaries and consolidated views of several participants and do not reflect individual positions and views.

Strengthen and expand Emissions Trading Scheme and CO2 taxes

The emissions trading scheme (ETS) sends clear signals for investments in low-carbon energy supply technologies in major industrial emitters participating in the scheme. It is also proposed to **further expand ETS into the transport and building sectors.**

As an expansion of ETS might be laborious until it is effectively functioning, **CO_2 tax** should permeate all sectors that are not covered or will not be covered by ETS. This includes a CO_2 tax on transport fuels (aviation, road) at similar levels as thermal fossil fuels.

Besides the domestic mitigation effort, stakeholders also highlighted the need for Switzerland to continue fostering cooperation for **internationally transferred mitigation outcomes** via bilateral agreements

As CO_2 tax risks and low acceptance rates, **policies to alleviate the distributional impacts** of high taxes on vulnerable income groups are also needed. A high ETS price could jeopardise the competitiveness of industries covered by ETS. Similarly, a high CO2 tax could create an additional financial burden for industries not covered by ETS. Complementary measures include **Carbon Contracts for Difference (CCfD)** in the industry as a fixed CO_2 price for certain emissions reductions. However, CCfD may interfere with the free price formation of ETS. Another complementary measure is the **voluntary agreements** for individualised emission reduction targets in the industries not covered by ETS. Finally, **carbon tariff** schemes like **a Carbon Border tax Adjustment Mechanism (CBAM)** are necessary to ensure a level playing field for Swiss and European industries. Such a mechanism would also require coordination with the EU and the establishment of a central **CBAM authority.**

Simplify permitting and implement technology-neutral tenders/auctions for accelerating the investment in renewable energy projects

Regarding the current regulation and legislation, stakeholders highlighted the necessity for **simplifying permitting and licensing processes and establishing coordinated regional and urban development planning between the different administration levels to relax some land-use restrictions, without compromising but** accounting for the trade-off with the landscape value. An **Energy and CO2 Acts coordination or combination into a single Act** could provide stronger and clearer signals to investors, harmonise climate targets with clean technology incentives and set common rules for planning, reporting, and monitoring.

Regarding the financial incentives for new renewable projects, stakeholders agreed

that **one-time capital subsidies** must remain for small-scale projects. Larger projects could be financially supported through **technology-neutral tenders and auctions**.

Provide incentives to technologies contributing to energy security

Stakeholders emphasised the need for instruments promoting technologies and options that can contribute to the security of supply. Among the proposed instruments is: a) **reimbursement to storage for holding reserve energy** (hydrostorage, batteries, etc.); b) **capacity market**; c) **reimbursement for standby reserve capacity** beyond ancillary markets; d) **demand-response tariffs** based on time-to-use as a direct incentive to end-users to reduce their load, or **direct load control tariffs** as incentives to end-users to accept load management by utilities; e) **development of regional planning** supporting the deployment of **base-load power plants** – including fossil-fuels if necessary; f) **continuation of existing nuclear power plants** but without subsidising their operation or retrofitting; g) **technology-neutral tenders** for renewable technologies with good winter availability, e.g., wind turbines, geothermal, alpine solar PV; h) mandates for **minimum reserves in gas** in winter.

All these instruments do not need to be applied simultaneously. Regarding the financing of these incentives, stakeholders identified the current network charges of EnG, the introduction of additional charges for energy security, and the **integration of "flexibility price" into the electricity price.**

Secure connections to EU-wide networks for energy carriers and CO_2 emissions transport…

Stakeholders highlighted the need to strive for an **agreement or contract with the EU** for exchanging electricity, biofuels, hydrogen and synfuels. In this context, bilateral agreements with neighbouring countries should also be pursued. These agreements shall not imply increased import dependency but rather **ensure affordable prices and flexibility** in the Swiss energy system. Stakeholders clearly emphasised reducing **import dependence on fossil fuels** by introducing, for example, a **quota system for fossil fuel imports,** by accounting in this quota the electricity produced by fossil fuels.

Besides energy markets, Switzerland will also need **access to CO_2 transport infrastructure in the EU** to transfer domestically captured emissions abroad for sequestration.

… and accelerate infrastructure deployment for new energy carriers and CO_2 emissions transport in Switzerland

Stakeholders also highlighted the need for Switzerland to develop domestic infrastructure for the new energy carriers. **Technology-neutral** incentives, such as auctions and tenders, are preferable, e.g., for alternative and synthetic fuel distribution. They can be complemented with **investment subsidies,** e.g., for charging infrastructure for electric cars **and feed-in tariffs**, for example, by feeding-in biomethane or syngas into the gas grid. Additional measures include **low-interest financing** and **streamlining licensing processes**, especially regarding land-use restrictions. In this regard, incentives via subsidies and faster-permitting processes for **district heating networks** using waste heat or **water from lakes for heating**

or cooling via heat pumps were perceived as policies that help decarbonise the building sector.

Stakeholders identified the need for large infrastructure development in the transport sector. **Subsidies for charging infrastructure development** and new **regulations for a minimum number of charging station requirements per (new) building o**r place where EVs are parked the longest are deemed important. A proliferation of charging infrastructure needs to be supported by the **simplified licensing for the expansion of transmission and distribution electricity grid capacity** and the increase of **grid connections** – and this needs further financing and electricity regulations adaptations. For those transport modes that are hard to electrify, stakeholders highlighted the need for **technology-neutral subsidies or tender/auction schemes** for new infrastructure financing and alternative fuels. For instance, developing synthetic fuel infrastructures.

Stakeholders also discussed the need to develop a domestic infrastructure to transport captured CO2 emissions from the sites where they are captured to sites where they can be utilised, sequestrated or exported abroad. Developing the respective infrastructure will be an asset for several industries in the long run.

Phase-out fossil fuels in transport via technology-switch in the near term and changes in mobility behaviour in the long-term

Stakeholders emphasised that **market-based instruments like CO_2 tax or ETS** are more acceptable than **prohibiting sales of new ICEV after 2030 or 2035**. Alternative measures could include **carbon budgets for certain mobility sectors** that correspond to stringent emissions reduction paths, **elimination of fuel tax reductions,** for example, in aviation**,** and **adaptation of LSVA for road freight** not to stop the transition to electric trucks. Another proposed measure is introducing **support for synfuels in freight and aviation** by acknowledging the challenge that domestic production of synfuels could be overly expensive.

Stakeholders also argued for **reducing motorised transport demand** via **urban and spatial planning** for promoting **car-sharing** schemes, infrastructure for **(e-) bike lanes** and increasing **pedestrian streets**. Electromobility would also require support from the electricity market **legislation to enable storage and demand-side response solutions** from EVs (Vehicle-to-Grid) and **compensation for flexibility and load management from transport.** Nevertheless, after 2040, stakeholders foresee that more instruments targeting behavioural changes in mobility must be implemented. In this regard, **smart mobility and interconnection modes** should be further expanded via the implementation of instruments like reduced tariffs for using bus and rail, the introduction of road pricing, promotion of combining car sharing and rail via incentives such as reduced travel or car use tariffs.

Decarbonise industry with zero-carbon fuels and technology standards

As mentioned above, **ETS** and **CO2 taxes**, complemented with measures like **Carbon Contracts for Difference**, **voluntary emissions agreements** and **Carbon Border Tax Adjustment,** are seen by the stakeholders as means and possible instruments for the decarbonisation of the Swiss industry. A challenge is that industrial assets are long-lived assets. To effectively decarbonise the industry, investors need to receive appropriate signals to mitigate risks in their decisions. To this end, these measures could help secure investment planning in the industrial sectors.

However, stakeholders recognised that industrial demand and emissions are inelastic, and the above mechanisms need to be further complemented with **technical standards on efficiency or emissions** for new industrial equipment. Purchasing low-carbon equipment needs **technology-neutral** financing instruments to be in place, such as **tax credits and subsidies.** These instruments should be designed to mitigate risk financing and ensure long-term rentability. Stakeholders suggested **avoiding immediate bans on certain technologies**, especially if alternative options are unavailable.

The latter calls for financial support for developing **infrastructure for accessing e-fuels and bioenergy** through subsidies or tenders. Bioenergy is deemed essential for the sector and stakeholders. They did not hesitate to propose that in the long run, we could consider **banning bioenergy in other sectors** where decarbonisation alternatives exist at lower costs than industry.

Decarbonise buildings via market-based instruments

Stakeholders identified three major hurdles in decarbonising the residential sector: the high upfront costs of renovation and purchase of low-carbon equipment, the split of incentives between tenants and landlords and the lack of skilled personnel in building renovation and heating equipment replacement projects. The proposed policies could tackle these challenges to a large extent, reduce emissions and increase efficiency.

In the policy planning until 2030, stakeholders highlighted the need for **digitalising energy in buildings** and improving the **accessibility of real-estate data** by updating the **Federal Register of Buildings and Dwellings (GWR)** and **mainstreaming the building energy certificate of the cantons (GEAK).** Proposed policies to be implemented within the current decade are: a) **tax deductions** for building renovations; b) **ecological standards** for renewable fuels and energy; c) **CO2 taxes** for heating fuels; d) **competitive tenders** with more standardised tender processes; e) **subsidies for CO_2-neutral heating systems** by also simplifying the existing cantonal subsidies schemes); f) **policies to create more jobs** in building renovation and heating equipment projects; g) **renovation incentives** for rented buildings; h) **split the CO_2 tax payment between owner and tenants.**

For the period 2030-2040, experts referred to policies such as: a) provision of **soft loans for stopping construction of buildings requiring CO_2-intensive materials** while accounting for life-cycle effects of the used materials; b) **mandatory audits for optimising energy efficiency measures**; c) **carbon performance requirements,** i.e., CO_2 emissions per square meter of floor area, which should also consider the grey energy of the building; d) **mandates for installing solar PV and battery systems in new buildings**; e) **minimum energy performance standards**.

For the post-2040 period, stakeholders suggested policies such as: a) "industrialisation" of building renovations via the concept of **serial renovation**, supported by appropriate financing schemes; b) **prohibiting the installation of new fossil fuel heating systems** - however, this policy needs to be supported by the provision of subsidies or soft loans for installing new low-carbon heating equipment; c) expansion of **ETS to include emissions from buildings**.