



**PRIED**

Policy Research Institute  
for Equitable Development  
Private Limited

QUARTERLY ENERGY MONITOR

**GST ON SOLAR PANELS &  
RELATED PRODUCTS—  
DELAYING THE ONSET OF  
SOLAR DRIVE**

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Policy Research Institute for Equitable Development



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## Introduction

Renewable technologies such as solar and wind are capital intensive. Major share of their life-cycle cost has to be incurred upfront. Thus, supportive policies play a key enabling role to its wide scale deployment and are seen as central to influencing increased responsiveness from potential adopters. Back in 2014, the government of Pakistan exempted taxes on import of solar panels. These tax breaks were introduced to boost the national solar drive. However, recently in the Supplementary Finance Bill 2021, the government surprisingly levied a general sales tax (GST) on the import of solar panels and its related [products](#) [1].

This recently approved Finance Supplementary Act 2022 (also known as “mini-budget”) is nothing short of a “tsunami of taxes”, as one of the placards held by the opposition leaders in the National Assembly protesting the bill in December last year displayed. The ill-timed renewed attempt to impose a tax on solar products is incompatible with the existing policy renewable uptake goals and ambitions. Not only that, it will also undermine the solar photovoltaic (PV) drive cutting into the country’s national emissions reduction potential and power generation indigenisation drive.

The approval of mini budget, necessitated by International Monetary Fund clearance of a \$1 billion tranche under the Extended Finance Facility of \$6 billion, has hard hit almost every economic sector of the country - with the imposition of sales tax and withdrawal of exemptions, to replacement of items from zero-rating category to the standard tax rate of 17%. The taxation on the import of solar power technology-related products is particularly damaging for the still nascent renewable energy (RE) market in the country, as it will break the slowly built momentum encouraging RE adoption for a variety of uses by a diverse range of users.

This move is also expected to be a major setback for the national goals of access to affordable and sustainable energy means (communicated under various national policies) and international commitments on climate change. Only recently, the government made commitments as part of Nationally Determined Contributions to increase the share of RE sources in the power generation mix to 60% by 2030. The Alternative and Renewable Energy Policy (ARE Policy 2019) also set progressive goals for non-hydro RE uptake, with a target of 20% share by 2025, and 30% share by 2030 in the power generation mix. Considering that only less than a decade is left to achieve these targets, the recent policy moves by the government, including the current imposition of sales tax, shows a lack of commitment in fighting climate change.

The National Climate Change Policy (NCCP, 2021) also defines goals for promotion of cleaner energy, low-carbon intensive development and formulation of economic incentives for engagement of public and private sector investments in adaptation and mitigation measures. The economic incentives can give the needed push to the nascent RE market, however, they are not synchronized with these commitments. In fact, what we are experiencing is reversal of incentives.<sup>1</sup> At a juncture, when globally cleaner energy sources are being incentivized for a green future, Pakistan has taken another step back by disincentivizing the means to harness abundantly available indigenous solar resource — especially in the absence of any local market to provide for the required volumes of solar technology.

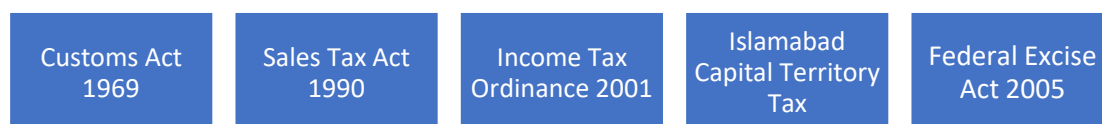
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<sup>1</sup> Besides withdrawing exemptions from solar, wind and other RE products, the amendments have also been made in the Tax Laws (Second Amendment Ordinance, 2021), which now restrict the exemption on income derived by IPPs on electricity generation for only those projects that had entered into an agreement with the Federal and/or Provincial Government and to whom a letter of support had been issued up to 30 June 2021. Thus, post 30 June 2021, the income of solar and wind energy projects will be taxed. Whereas, on the other hand we see preferential treatment given to coal supplying companies. As per the latest amended Income Tax Ordinance 2001, clause 65F, coal mining projects in Sindh supplying coal exclusively to the power generation projects are eligible for 100% tax credit on their taxable income.[6]

In this issue of quarterly energy monitor, we look into the details of stated taxation on solar panels and related critical components, as well as review its implications. Furthermore, we explain why the GST imposition will only add further complexities—since the local industry for the production of these products today is negligible. The uneven statistics indicate that more than 90 percent of the consumer market for solar PV panels is met via imported products. For carrying out the analysis, we have reviewed the Finance Supplementary Act 2022, The Sales Tax Act 1990, Circular no. 6 of 2022 “Explanation of Important Amendments in Sales Tax Act 1990, ICT (Tax on Services) Ordinance 2001 and Federal Excise Act 2005” and A Brief on Finance (Supplementary) Bill 2021 by KPMG.

## Quick Glance at the Mini-Budget: Exemptions Withdrawn from Solar Products

The mini-budget was presented in the National Assembly as a mean to achieve efficiency and equity in the tax system, broadening of tax base and documentation of the economy. For this purpose, the mini-budget has mandated amendments in the following acts:



The imposition of GST on solar products has been done through amendments in the Sales Tax Act 1990 (Sales Tax). As per the Sales Tax, GST is charged on all taxable supplies and goods imported into Pakistan at a standard rate of 17%<sup>2</sup>[5](5). However, if there are any exceptions, for example goods exempted from GST, or goods that are charged at GST rate other than 17%, they are mentioned in specific Schedules in the Sales Tax. So, the **Fifth Schedule** to the Sales Tax, enlists products in the zero-rating category<sup>3</sup>, which are levied a refundable input tax and output tax is zero. The **Sixth Schedule** enlists products in the 100% GST exemption category and **Eight Schedule** enlists products charged at a GST rate other than 17%.

The government has retained concessions for most of the products under basic health, food and education category in the Sixth Schedule in the amended Sales Tax. However, the solar PV, wind and other RE based products, which were earlier part of the Sixth Schedule i.e., before the mini-budget approval, have been taken out of the list. These products are now taxed at 17% sales tax, with an additional sales tax of 3% that could be charged to importers who do not carry a registration number. The government has also not provided any rationale for withdrawing the exemptions from RE in the Circular No. 6—aimed at explaining the reasons for the withdrawal of the exemptions.<sup>4</sup>

Table.1 gives a quick snapshot on solar products on which the sales tax has been imposed.

<sup>2</sup> An additional sales tax of 3% will be charged only if the procurer does not carry a registration number. [5]

<sup>3</sup> Zero-rated items are those on which output tax is zero, and input tax can be claimed as refundable. [3]

<sup>4</sup> The electric vehicles have also been targeted in these amendments. Whereas, electric mass transit means such as electric buses, three-wheeler rikshaws, trucks, and movers, continue to be in the list of exempted goods. But the import of hybrid electric vehicles up to 1800CC have been levied sales tax at a rate of 12.5%, and import of completely built up electric vehicles are charged sales tax at a rate of 17%. [2]

**Table 1: List of Taxed Solar Products as per the Finance Supplementary Act, 2022**

1. Solar PV panels
2. LVD induction lamps
3. SMD, LEDs, with or without ballast, with fittings and fixtures
4. Wind turbines including alternators and mast
5. Solar torches
6. Lanterns and related items
7. PV modules along with related components including invertors, charge controllers and batteries
8. Tubular daylighting device
9. Energy saver lamps and tube lights of varying voltages (operating on AC or DC)
10. Invertors (off-grid/on-grid/ hybrid) with provision for direct connection/input from RE source and with Maximum Power Point Tracking
11. Off-grid/on-grid solar power system (with or without provision for USB/charging port) comprising: <ul style="list-style-type: none"><li>• PV module.</li><li>• Charge controller</li><li>• Batteries for specific utilization with the system (not exceeding 50 Ah in case of a portable system)</li><li>• Essential connecting wires (with or without switches)</li><li>• Invertors (off-grid/ on-grid/ hybrid with provision for direct connection/ input RE source and with Maximum Power Point Tracking (MPPT)</li><li>• Bulb holder</li></ul>
12. Water purification plants operating on solar energy
13. Solar Parabolic Trough Power Plants consisting of parts: <ul style="list-style-type: none"><li>• Parabolic Trough collectors' modules</li><li>• Absorbers/Receivers tubes</li><li>• Steam turbine of an output exceeding 40MW</li><li>• Steam turbine of an output not exceeding 40MW</li><li>• Sun tracking control system</li><li>• Control panel with other accessories</li></ul>
14. Solar Dish Stirling Engine consisting of parts: <ul style="list-style-type: none"><li>• Solar concentrating dish</li><li>• Sterling engine</li><li>• Sun tracking control system</li><li>• Control panel with accessories</li><li>• Stirling Engine Generator</li></ul>
15. Solar Air Conditioning Plant consisting of parts: <ul style="list-style-type: none"><li>• Absorption chillers</li><li>• Cooling towers</li><li>• Pumps</li><li>• Air handling units</li></ul>

<ul style="list-style-type: none"> <li>• Fan coils units</li> <li>• Charging &amp; testing equipment</li> </ul>
<p>16. Solar Desalination System consisting of parts:</p> <ul style="list-style-type: none"> <li>• Solar PV panels</li> <li>• Solar water pumps</li> <li>• Deep Cycle Solar Storage batteries</li> <li>• Charge controllers</li> <li>• Inverters (off grid/on grid/ hybrid) with provision for direct connection/input from RE source and with Maximum Power Point Tracking (MPPT)</li> </ul>
<p>17. Solar Thermal Power Plants with accessories</p>
<p>18. Solar Water Heaters consisting of parts and accessories:</p> <ul style="list-style-type: none"> <li>• Insulated tank</li> <li>• Vacuum tubes (Glass)</li> <li>• Mounting stand</li> <li>• Copper and Aluminum tubes</li> <li>• Electronic controller</li> <li>• Assistant/Feeding tank</li> <li>• Circulation pump</li> <li>• Electric heater/Immersion rod (one piece with one solar water heater)</li> <li>• Solenoid valve (one piece with one solar water heater)</li> <li>• Selective coating for absorber plates</li> </ul>
<p>19. PV Modules consisting of parts and accessories:</p> <ul style="list-style-type: none"> <li>• Solar cells</li> <li>• Tempered glass</li> <li>• Aluminum frames</li> <li>• Ring</li> <li>• Flux</li> <li>• Adhesive labels</li> <li>• Junction box and cover</li> <li>• Sheet mixture of paper and plastic</li> <li>• Ribbon for PV Modules (made of silver &amp; Lead)</li> <li>• Bypass diodes</li> <li>• EVA (Ethyl Vinyl Acetate) Sheet (Chemical).</li> </ul>
<p>20. Solar Cell Manufacturing Equipment</p> <ul style="list-style-type: none"> <li>• Crystal (Grower) Puller</li> <li>• Diffusion furnace</li> <li>• Oven</li> <li>• Wafering machine</li> <li>• Cutting and shaping machines for silicon ingot</li> <li>• Solar grade polysilicon material</li> <li>• Phosphene Gas</li> </ul>

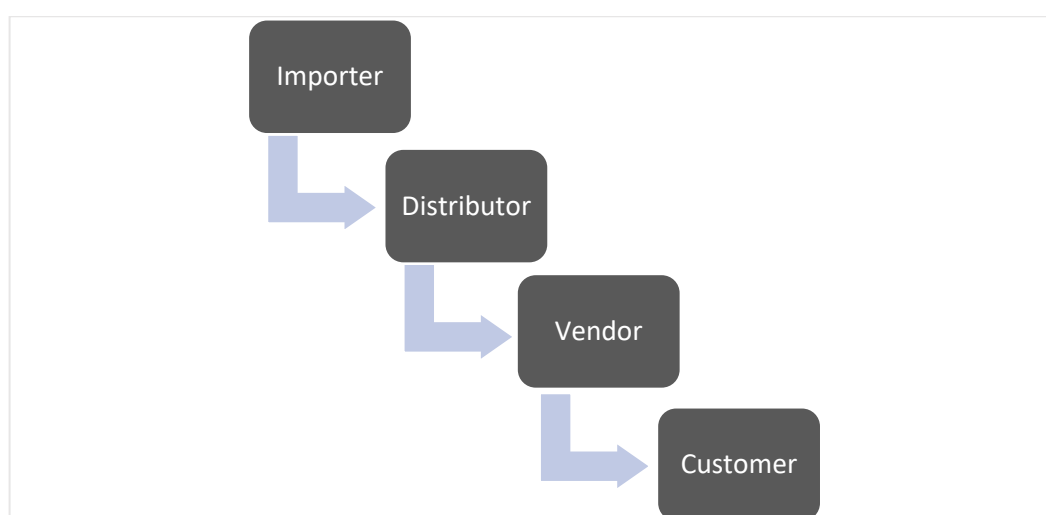
<ul style="list-style-type: none"> <li>Aluminum and silver paste</li> </ul>
21. Pyranometers and accessories for solar data collection
22. Solar chargers for charging electronic devices
23. Remote control for solar charge controller

Source: The Sales Tax Act 1990 (amended as of January 2022)[5]

## Implications of the Taxation on the Solar Drive

To fully understand the implications of the recently imposed tax on solar panels and related products, it is important to analyze the process flow of PV imports. There are four actors involved in the supply chain (procurement to end-user) of solar PV supply in Pakistan, shown in Fig. 1. Starting with an importer who imports the required products, followed by the distributor who then further dispenses the technology to vendors, and finally the user who installs the technology at their premises [7].

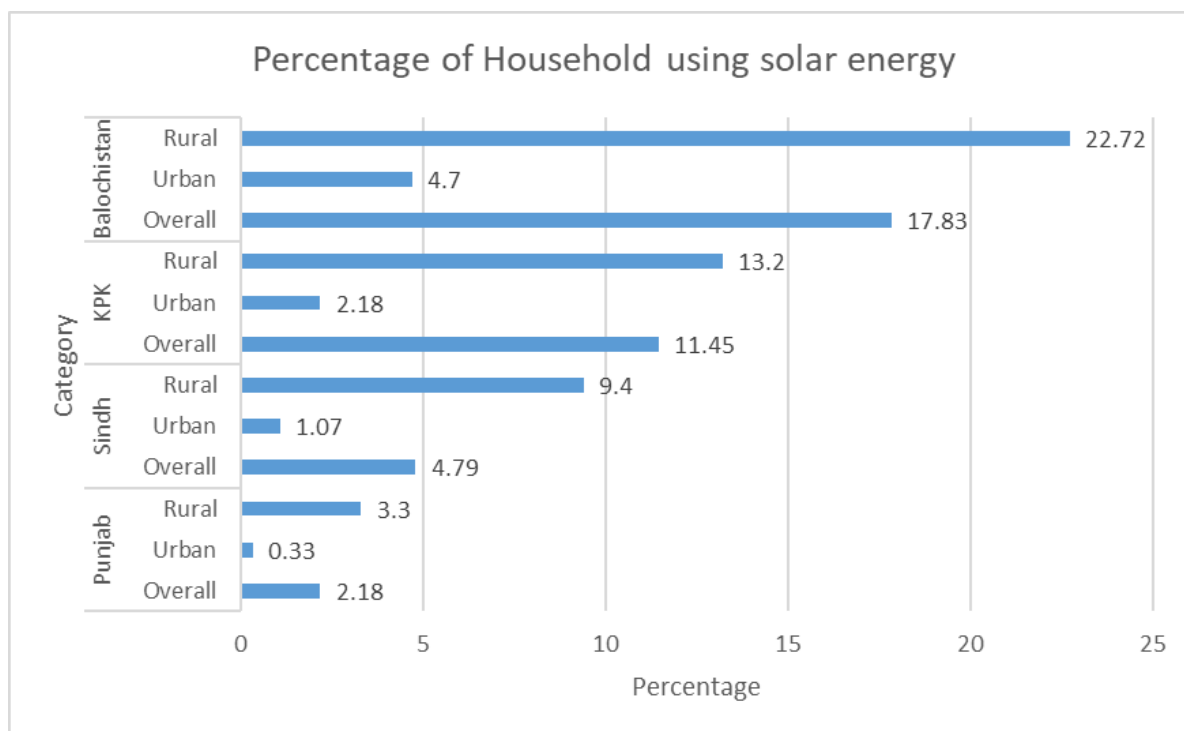
At each level of this value chain, a financial transaction takes place, while every transaction factors in the required imposed taxes and duties. In this context, the importer in Pakistan pays 17% sales tax, 3% additional sales tax if not registered, 11% income tax, 4% custom charges, and 16% customs duties [8]. Additionally, when factored in the bulk freight charges (which have already surged to \$6000 from \$800 before the Covid-19 pandemic), this significantly increases the final cost of the technology.



**Figure 1: Solar PV Import Process Flow**

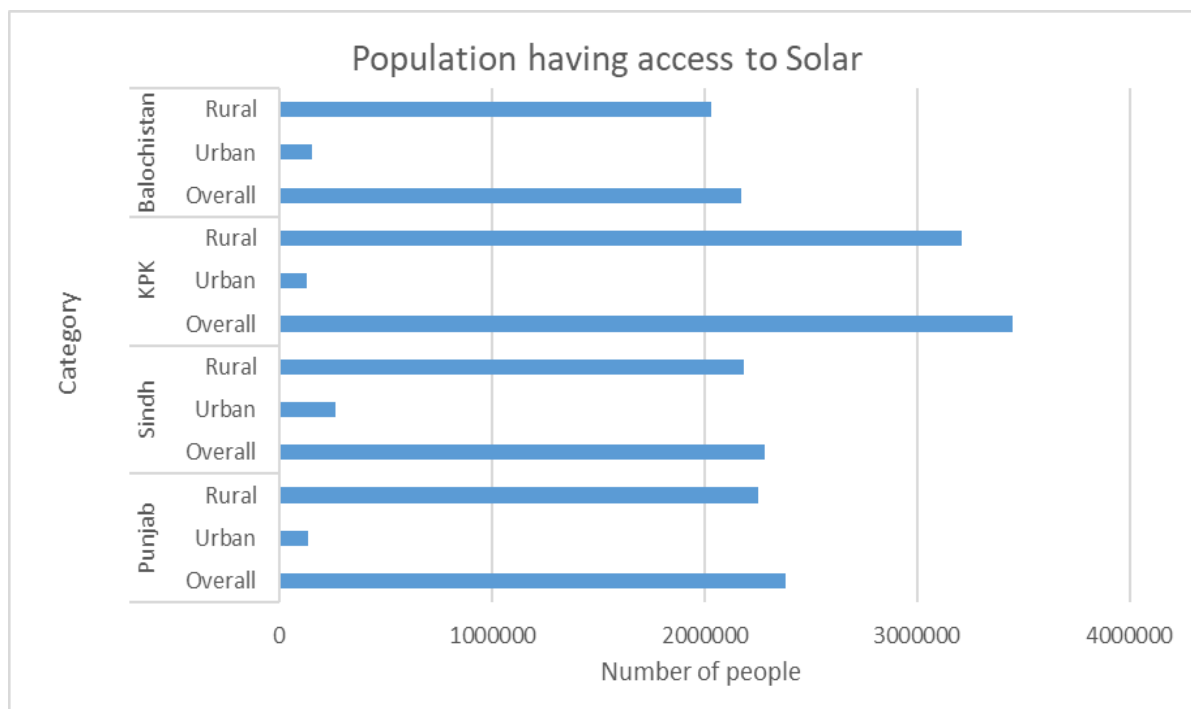
In Pakistan, contrary to the limited growth of other market segments during the pandemic, solar panels sales have gone up 80%, catering to the increased demand in rural areas as well as net metering adoption in urban areas in the last two years. In 2014, the import of PV products stood at

260 MW [9], which has now jumped to 2.38 GW owing to the increased demand in agriculture, residential and industrial sectors (see Fig.2 and Fig.3).



**Figure 2: Percentage of Household using solar energy**

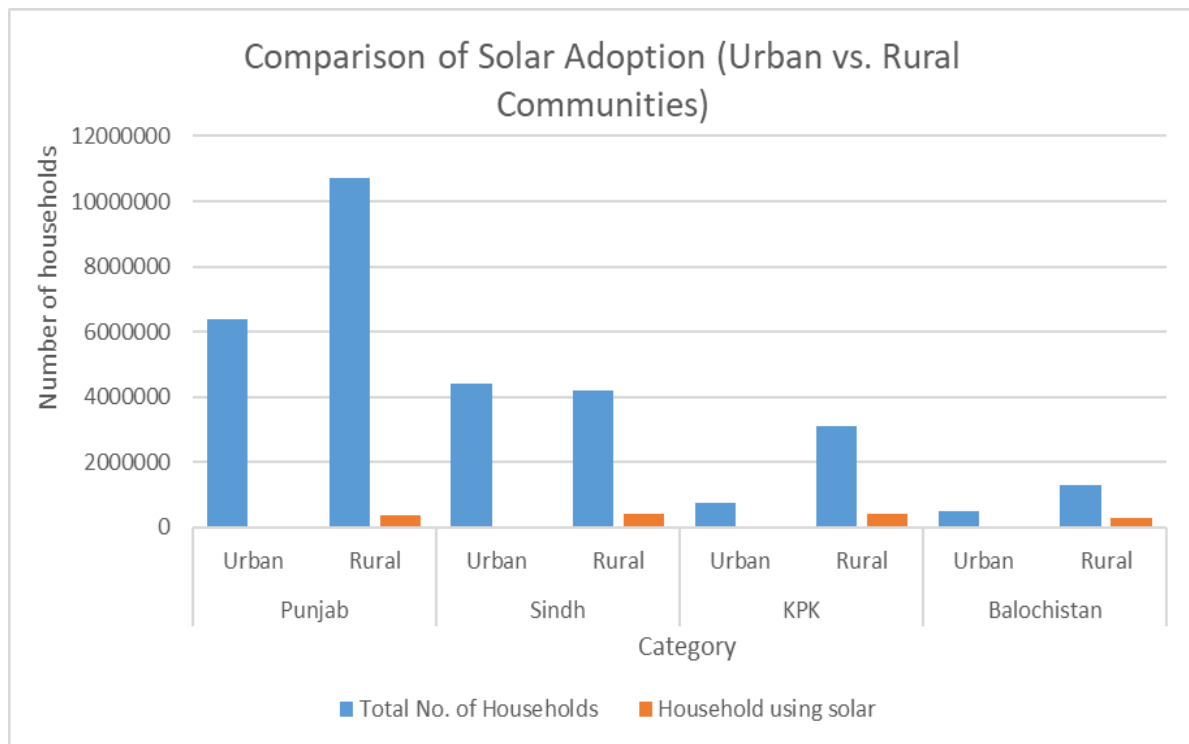
Source: Pakistan Bureau of Statistics (2020)



**Figure 3: Population having access to Solar**

Source: Pakistan Bureau of Statistics (2020)





**Figure 4: Comparison of Solar Adoption (Urban vs. Rural Communities)**

Source: Pakistan Bureau of Statistics (2020)

### Extensive Reliance on Imported Solar Products

Presently, the domestic production of solar products in Pakistan is negligible. Solar market in the country is largely dominated by imported products—mostly from China. More than 90% of components used in off-grid and on-grid solar PV systems are imported from China. This includes PV modules, inverters, deep cycle batteries, PV cables, charge controller, junction boxes, standalone solar equipment, standalone lightning kits and stand-alone water pumps. In terms of local production, mounting structures, wires and lead-acid batteries are the only solar-related equipment that is being manufactured indigenously [9]. It is worth mentioning here that the use of flooded lead-acid batteries as a storage unit is not considered feasible for the solar PV system by the experts.

From 2013 to 2015, the imports of solar panels quadrupled from 44 million dollars to 243 million dollars [11]. When the GST was waived off in 2017, imports of solar panels rose to 722 million dollars [12]. This significantly lifted the local PV market. In the following years, the market recorded average growth due to the pandemic and showed notable recovery by the mid of 2021 when it recorded 536 million dollars worth of solar equipment imports. Till 2021, Pakistan imported 2380 MW of solar panels, which is worth more than 1 billion dollars - a number far greater than previous years [13]. The recent ill-timed taxation will, however, impact the growth of the previous years and also fuel the unregulated local market where sub-par solar panels, inverters are already covering the major chunk of market share.

## Effect of the GST on System Cost

In the wake of the recently imposed taxation, solar vendors and installers across the country have revised their prices exponentially to accommodate their profit margins. Uneven data suggests that the price of each solar PV module of 540 watts has increased by 30% depending upon the category of solar panels. For example, the category A solar panel's costs per watt have been augmented by Rs 55 to Rs 70. Similarly, the overall cost of each 540 watt panel has increased by the rate of Rs 8100 per panel.

Table 2 showcases the knock down effect of the recently imposed GST on 5, 10 and 15-KW systems. For accurate results, analysis of Market Retail Price (MRP) of unregulated market as well as the regulated market is done. In addition to that, the system packages given by licensed solar vendors have also been analyzed to gauge the effect of GST on solar PV market.

In terms of price comparison based on the size of PV systems, the Table 2 presents the estimation of commonly used solar home systems in Pakistan. Since the market has a wide-range of PV equipment—the overall percentage increase in prices varies in the range of 30% to 50%, based on the type of PV system components being used. The rated PV system costs have surged to almost 50% in comparison to the previous years factoring in all the variables whereas the cost of substandard PV system, especially in rural areas, has recorded an increase of 30%.

Moreover, there are two types of systems that are mostly used in Pakistan (see Table 2). The first type is the hybrid systems with batteries, which are mostly installed in households experiencing regular load shedding or those residing in off-grid areas. The second type is the on-grid systems installed in households, which plan to adopt net metering in the future. The percentage increase in cost of both systems depends on the size of the PV system. For example, the cost of lower capacity PV system of hybrid and on-grid systems category is higher as compared to 10 KW system and above. Therefore, the middle-class section of society, who usually opts for PV systems less than 5 KW, is going to suffer the most in relation to the affordability of the solar system.

**Table 2: Cost comparison of PV system**

System Capacity	Hybrid system with batteries			On-grid System Fixed Structure Price		
	(Amount in Rs.)			(Amount in Rs.)		
	2020-21 (Rs.)	2022 (Rs.)	% Increase	2020-21 (Rs.)	2022 (Rs.)	% Increase
5 kW	700,000	1,100,000	57	550,000	850,000	54
10 kW	1,200,000	1,900,000	50	950,000	1,400,000	47
15kW	1,800,000	2,600,000	44	1,400,000	2,000,000	42

## Support Measures to Facilitate Solar Drive—Insight into Some Global Practices

The successful adoption of RE technologies, wherein they have grown from a niche solution to being deployed widely—is largely due to the supporting policies adopted by governments globally. These policies pave the way for more financially viable investment, hence increasing the pace of deployment. Primary criteria for a successful incentive scheme and support measures include ensuring low generation costs, reducing management costs, building investor trust, reducing consumer billing, raising public awareness and promotion, and the most essential eliminating environmental externalities.

By now, almost all of the world's major economies have clean energy support measures, usually in the form of feed-in-tariffs, obligatory quotas, tax exemptions, tax holidays on energy generation income, investment incentives, cap and trade programs, and/or climate legislation. For instance, in countries such as India, Turkey, Mali, Tanzania and Ethiopia, governments have waived the licensing requirements for certain electrification projects and organizations to facilitate the private sector and medium-sized solar plants [14].

In the USA, home solar owners who are also liable to pay taxes, get 26% of the investment on deploying solar systems (equipment and installation cost) as tax credit through a scheme called “federal solar tax credit/investment tax credit (ITC)”. Additionally, states such as Colorado and utilities offer rebates to installers, which reduce the cost of solar panels by 10% to 20%. Some indirect tax incentives are also offered by these states such as California, where buyers do not need to pay 4% sales tax on solar equipment and property tax exemption is offered to buyers of residential solar system installation. In this way, the government adds value to their homes by reducing the upfront cost of solar panels and protecting owners from paying taxes on their homes [15]. For commercial solar systems, some states offer a tax reduction scheme known as “Modified Accelerated Cost Recovery System”, through which businesses can deduct their investment on the solar system (qualified for scheme) from their income, hence decreasing their tax burden.

In Canada, PV system equipment is supported through Accelerated Capital Cost Allowance. In some parts of Canada where even the solar potential is not very encouraging, the maximum rebate on solar system is 25% of the system cost. While in other parts, the incentive program offers a 40% rebate of the on-grid system cost [16].

China also adopted fiscal and tax incentives by waiving off tax and duties on the import of solar equipment. The success of China in adopting high levels of PV lies in subsidy programs, which include 50% subsidy on the total investment cost of a rooftop PV integrated building. For encouraging end consumers to install a solar system, Brazil has put a 30% tax on the difference of energy supplied to the network and received by the network [17].

According to Costa Rica Law 7447, components of the PV system (panels, inverters etc.) and power electronic devices are exempted from excise tax, general sales tax and the custom tax. Philippine offers income tax holiday to the registered RE developers for the first seven years of commercial operations and any additional investment is also entitled to additional income tax exemption. Not only this, the Philippine government also made RE equipment import duty-free for 10 years and offers partial/full rebates on the purchase of solar system equipment [18].

In India, “Rajiv Gandhi Grameen Vidyutikaran -Yojana (RGGVY) Scheme”—funded by the government to electrify all rural areas—provides 90% of the funds as subsidy and the rest of them as loans,

whereas 100% subsidy is given to households below the poverty line [19]. Likewise, under the “*Special Incentives Package Scheme (SIPS)*”, the Indian government incentivized 20% of the capital cost to the solar units inside special economic zones for 10 years and 25% to those solar units outside these zones. Another program referred to as “*Jawaharlal Nehru national solar mission*”, funds solar projects on a debit-equity basis, where 30% of the system cost is subsidized, and soft loans are provided on a merely 5% interest rate [19]. For far-fetch areas and districts on Indian borders, the capital subsidy reaches 90% of the capital cost. Interestingly, the Indian government also offers 100% cost subsidy for innovative and novel solar projects. Moreover, import of solar devices has zero or concessional duty [19].

For the adoption of solar technology, Belgium, Spain, Ireland, China, the USA, and South Korea are also offering tax reductions through various incentive schemes by 14.5%, 12%, 12.5%, 15%, 30%, and 10%, respectively [12]. In Mexico, according to the Law for the Development of Renewable Energy and Energy Transition Financing (LAERFTE), taxpayers are allowed to deduct 100% of the solar equipment cost for corporate income tax purposes [20]. Table 3 provides a quick snapshot of the prevailing RE promotion policies and incentives.

**Table 3: A global perspective on RE promotion policies and incentives [21]**

RE promotion policies and incentives	Countries
<b>Feed-in tariff</b>	Austria, Canada, Cyprus, Czech Rep., Estonia, Denmark, France, Germany, Greece, Hungary, Ireland, Israel, Japan, Korea, Latvia, Lithuania, Luxemburg, Netherlands, Portugal, Slovak Rep, Slovenia, Spain, Sweden, Switzerland, United States, Ukraine, Algeria, Argentina, Brazil, China, Costa Rica, India, Indonesia, Nicaragua, Sri Lanka, Thailand, Turkey, Kenya, Ecuador, Albania, Bulgaria, Croatia, Macedonia, Uganda
<b>Renewable portfolio standards</b>	Australia, Belgium, Canada, Italy, Korea, Poland, Sweden, United Kingdom, United States, China, India, Thailand, Chile
<b>Capital subsidies, grants or rebates</b>	Australia, Austria, Belgium, Canada, Cyprus, Czech Rep., Finland, France, Germany, Greece, Ireland, Italy, Korea, Japan, Lithuania, Luxemburg, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, United Kingdom, United States, Argentina Cambodia, China, India, Thailand, Turkey
<b>Investment or tax credit</b>	Austria, Belgium, Canada, Czech Rep., Denmark, France, Germany, Greece, Ireland, Italy, Lithuania, Luxemburg, Netherlands, Norway, Portugal, Slovak Rep., Spain, Sweden, United States, China, Guatemala, India, Mexico, Nicaragua, Philippines
<b>State tax, energy tax, or VAT reduction</b>	Canada, Czech Rep., Estonia, Finland, France, Germany, Hungary, Korea, Malta, Poland, Portugal, Sweden, United Kingdom, United States, China, Guatemala, India, Philippines
<b>Energy production payments or tax credit</b>	Finland, Netherlands, Sweden, United States, Argentina
<b>Public investment, loans or financing</b>	Australia, Canada, France, Germany, Hungary, Japan, Latvia, Lithuania, New Zealand, Poland, Slovak Rep., Spain, United States, Brazil, China, India, Philippines

An evidence of government support for uplifting of solar technology can be taken from Colombia, where laws and policies support tax exemptions/reduction on sale of electricity from RE resources, exemption from value-added tax on imports of RE generation equipment and offers risk premium to incentivize the implementation of RE technology in non-interconnected zones. As a result, Colombia's current energy market has achieved liberalization and growth with the increasing number of participants and private financial investment [20].

## Conclusion

Pakistan plans to expand its power sector substantially in the years ahead. The country has a huge solar PV potential and all the necessary conditions for its implementation such as high radiation yield, a regulatory framework, favourable architectural landscape and strong demand forces that support its development. The ARE Policy 2019 also aims to produce 30% of its energy from non-hydro RE resources by 2030, whereas the revised Nationally Determined Contributions commit to a 60% RE share to be achieved in the next decade.

However, support policies are considered an important enabler for catalysing rapid socio-technical transitions. Unlike other countries, Pakistan's renewable energy market is already at a nascent stage. This newly imposed tax will increase the retail prices of the complete system for potential adopters and thus, disincentivise the national solar drive. The increase in the system cost will have a direct bearing on the profitability of investors and vendors, discouraging potential investment in the sector which will consequently widen the gap between imported fossil fuel-based power generation and solar PV energy base – delaying the onset of the targeted indigenization of power procurement resources. Importantly, amongst the different PV customer segments in the Pakistan market, the residential sector remains one of the key sectors driving the solar PV growth in the country and is also one of the most price-sensitive sectors. Hence, any further price hikes will only constrain the drive towards solar PV adoption.

The national-level ambition on advancing renewable resources and indigenizing energy procurement could be easily transposed as more than 30,000 villages in the country are still without electricity and about 56 million people, particularly in the rural areas, currently live in darkness while the remainder lack reliable access to energy supply. Solar installations have already seen an unprecedented growth in off-grid and weak grid regions. There has particularly been an exponential growth in solar tube wells and water pumps for irrigation purposes to counter the soaring diesel and petrol fuel prices in the domestic market. Due to the rising electricity tariffs, there has also been a growing trend in net metering and distributed generation. This clearly indicates that people are shifting towards affordable and sustainable energy resources. Based on the context, solar power has the potential to play a key role in facilitating transition to low-carbon energy, mitigating climate change, meeting energy demands, and reducing energy poverty. However, to create a coherent push to tap these potential indigenous resources, focused interventions and supportive instruments are needed which could trigger transition from the perspective of technology adopters and investors.

Progressive economies of the world are evolving RE policies to incentivize the stakeholders and support the solar industry's growth. Based on the context, we propose reversal of taxes on solar PV and related products, as well as the need for a long-term strategy which could facilitate and unleash the solar drive in the country. So, overall analyzing, rather than imposing taxes, the Pakistani government needs to offer loan programs, rebates, duty exemption and credit schemes. Developing policies and tax benefits that help RE integration should be the government's topmost priority.

Pakistan can make significant gains in terms of decarbonization and low carbon development if it facilitates RE adoption and waives off the additional taxes. In parallel, the government should also extend substantial support to domestic RE manufacturing firms in the short-medium term, to constructively reduce reliance on imported manufactured solar products—hospitable institutional/business models provide the much needed ‘protective space and enabling environment’ for the configuration and development of new technologies. Without the right models for commercialization, the diffusion of technological innovations might be slow or even not happen. The need of the hour is a long-term strategy, which retains steady growth trajectory for solar while increasing protection against imported panels in longer run through incentivizing local production.

## Annexure

**Table 1: Amendments Related to Products Promoting RE Technologies and Electrification of Vehicles in the Sales Tax**

1.	<p>Following items for promotion of RE technologies or for conservation of energy:</p> <ul style="list-style-type: none"> <li>• SMD/LED/LVD lights with or without ballast, fittings and fixtures.</li> <li>• SMD/LED/LVD lights, with or without ballast, PV module, fitting and fixtures</li> <li>• Tubular Day lighting Device</li> <li>• Wind turbines including alternators and mast</li> <li>• Solar torches</li> <li>• Lanterns and related instruments</li> <li>• LVD induction lamps</li> <li>• LED Bulb/Tube lights</li> <li>• PV module, with or without, the related components including invertors (off-grid/on grid/ hybrid) with provision for direct connection/input from RE source and with Maximum Power Point Tracking (MPPT) with charge controllers and solar batteries</li> <li>• Light emitting diodes (light emitting in different colors)</li> <li>• Water pumps operating on solar energy along with solar pump controllers</li> <li>• Energy saver lamps of varying voltages</li> <li>• Energy Saving Tube Lights</li> <li>• Sun Tracking Control System</li> <li>• Invertors (off-grid/on grid/hybrid) with provision for direct connection/input from RE source and with Maximum Power Point Tracking (MPPT)</li> </ul> <p>Charge controller/ Current controller. Provided that exemption under this serial shall be available with effect from 01.07.2016.</p>
2.	Wind turbines for grid connected solution above 200 KW (complete system)
3.	<p>Wind turbine upto 200 KW for off grid solutions comprising of:</p> <ul style="list-style-type: none"> <li>• Turbine with Generator/ Alternator</li> <li>• Nacelle with rotor with or without tail</li> <li>• Blades</li> <li>• Pole/ Tower</li> <li>• Inverter for use with Wind Turbine</li> <li>• Deep Cycle Cell/ Battery (for use with wind turbine)</li> </ul>
4.	Wind water pump
5.	<p>Geothermal energy equipment:</p> <ul style="list-style-type: none"> <li>• Geothermal Heat Pumps</li> <li>• Geothermal Reversible Chillers</li> <li>• Air handlers for indoor quality control equipment.</li> <li>• Hydronic heat pumps.</li> <li>• Slim Jim heat exchangers</li> <li>• HDPE fusion tools</li> <li>• Geothermal energy Installation tools and Equipment.</li> <li>• Dehumidification equipment.</li> </ul>

	<ul style="list-style-type: none"> <li>• Thermostats and Intellizone</li> </ul>
6.	Any other item approved by the Alternative Energy Development Board (AEDB) and concurred to by the FBR
7.	<p>The exemption on sales tax under Sixth Schedule is maintained by the mini-budget on import and supply of completely knocked down (CKDs) kits by local manufacturers of following electric vehicles:</p> <ul style="list-style-type: none"> <li>• Road tractors for semi-trailers (electric prime movers)</li> <li>• Electric Buses</li> <li>• Three-wheeler electric rikshaw</li> <li>• Electric truck</li> <li>• Electric motorcycle</li> </ul>
8.	Prior to the mini-budget, the import and local supply of Hybrid Electric Vehicles (HEVs) up to 1800CC, and HEVs from 1801–2500CC were subject to sales tax at 8.5% and 12.75% respectively. Now import and supply of HEVs up to 1800CC will be taxed at a uniform rate of 12.5% under Eighth Schedule of the Sales Tax Act 1990.
9.	The reduced rate of 5% sales tax on import of electric vehicles in Complete Built Up (CBU) condition has been increased to the standard sales tax rate of 17%.

Source: The Sales Tax Act 1990 (amended as of January 2022)[5]



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