

# Renewables and Transport

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*Angel Cortez*

This paper will highlight the opportunity to create more sustainable and resilient transport systems powered by renewable energy as they recover from COVID-19. It will discuss this opportunity in the context of the sector's impact in reducing emissions, as per the Paris Agreement, and achieving an equitable 1.5°C planet. Three cities are featured to exhibit the potential, impact, and challenges of integrating renewable energy sources into transport systems in striving for sustainable transport: New Delhi, India, Romblon, Philippines and Montevideo, Uruguay.

## Key Messages

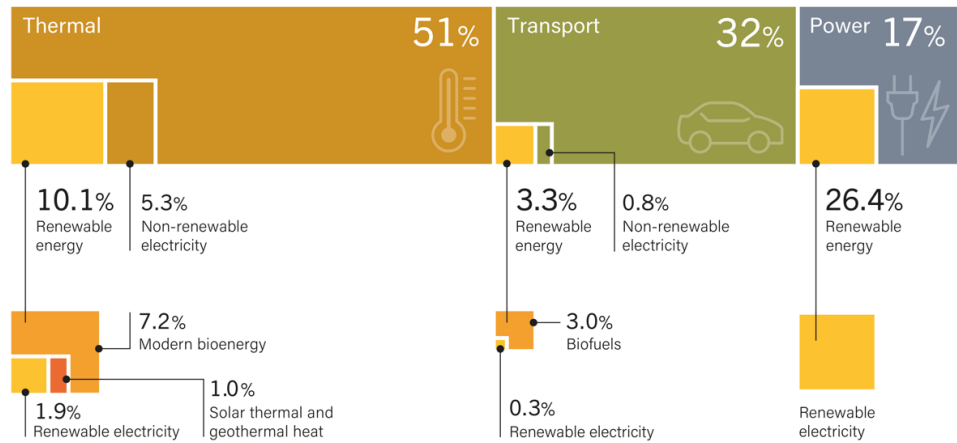
- The transport sector accounts for 32% of global energy demand, yet holds the lowest share of renewable energy at 3%.<sup>1</sup>
- There is an opportunity to integrate renewables into transport systems during their recovery from the impacts of COVID-19, which plummeted transport demand and its corresponding emissions.<sup>2</sup>
- Governments should take a holistic Avoid-Shift-Improve approach in their recovery of transport and achieving a low-carbon system.<sup>3</sup>

## Introduction

The impacts of COVID-19 have created an opportunity for governments to shift to greener transport systems. Global transport demand experienced a drastic decline by mid-March of 2020, with up to a -90% change in some countries and cities where strict quarantine guidelines were implemented.<sup>4</sup> Despite the likelihood of returning to private cars with the offset of oil supply and demand, governments should take advantage of the opportunity to integrate policies promoting low-carbon modes of transport during this period of recovery.<sup>5</sup>

The transport sector holds among the second largest share of global total final energy demand at 32%, yet holds the lowest share of renewable energy at 3% (shown below in Figure 1). Three case studies featured below exhibit how cities have successfully incorporated renewable energy into their transport systems, reducing their local emissions by increasing the sustainability of their transport modes. As cities begin to recover from COVID-19, there is a key opportunity for governments to similarly improve their transport networks and reduce transport emissions by applying the Avoid-Shift-Improve framework with renewable energy.

Renewable Share of Total Final Energy Consumption, by Final Energy Use, 2017



Note: Data should not be compared with previous years because of revisions due to improved or adjusted methodology.

Source: Based on IEA data.

REN21 RENEWABLES 2020 GLOBAL STATUS REPORT

Figure 1.<sup>6</sup>

## Case Study No. 1 | Solar-powered rickshaws in New Delhi, India

In recent years, India has become a prominent leader in renewables, striving for the ambitious target to double the share of renewable energy in the country's total installed power capacity to 40% by 2030.<sup>7</sup> Housing about a sixth of the world's population and globally is the third largest emitter of GHGs, meeting energy demand has been a challenge for India. Access to self-sufficient forms of universal energy discernibly became a national priority. By 1992, India was among the first countries to establish a Ministry of Non-Conventional Energy Sources, which would later become the Ministry of New and Renewable Energy in 2006.<sup>8</sup>

Transport is the largest contributor to India's GHGs emissions, accounting for 289 million tons CO<sub>2</sub>.<sup>9</sup> Integrating renewable energy sources into the sector is essential to shifting towards sustainably meeting growing energy demand. Within the latter part of the decade, India has notably modeled the shift toward renewable-fuel modes of transport: incorporating solar energy into its railways, and more notably into its prevalent rickshaw services.

Since 2017, India has launched several projects to implement solar power in their transport systems, such as those in its national railways.<sup>10:11</sup> However, in 2019, solar rickshaws debuted on the Indian Institute of Technology (ITT) New Delhi campus under Central Electronics Limited, adding 10 solar-power hybrid rickshaws to the campus network. The 300-watt solar vehicle roofs allow the vehicles to charge during the day and doubled the daily mileage drivers would be able to cover. Officials noted that this installation not only mitigates the physical labor of driving rickshaws, but also allows drivers to increase their daily earnings. Unfortunately, attempts to launch similar projects beyond campus, such as that in Sahibabad, Ghaziabab were halted by police authorities.<sup>12</sup>

As of 2020, New Delhi has since expanded its electric rickshaw inventory to an estimated 1.5 million servicing the streets. These electric rickshaws are predominantly still reserved for short trips, especially covering the "last mile" between mass transport and user destinations. This expansion is reported to serve a well-established market niche, especially as employment for lower income urban households.<sup>13</sup>

Despite these efforts to incorporate solar energy in transport, New Delhi's, along with the rest of India, largest barrier to achieving its renewable energy target is lack of investments.<sup>14</sup> The integration of electric rickshaws in New Delhi exhibit how pilot projects for renewable energy in transport can largely benefit communities and reduce transport emissions, if proven successful and expanded through investment.

## Case Study No. 2 | Wind power and electric scooters in Romblon, Philippines

In 2019, the island of Romblon, Philippines successfully launched a pilot project of 100 electric scooters. Throughout the country, scooters are a primary mode of transport for its inhabitants.<sup>15</sup> Thus, the electrification of these vehicles not only holds potential in reducing local GHG emissions but can possess greater impacts if implemented at a national level. This project was carried out through the collaboration of Romblon Island's local electricity cooperation (ROMELCO), and Japanese manufacturers Honda and Komaihaltec. These electric scooters are equipped with rechargeable batteries powered and charged by three new wind turbines.

The electrification of scooters on Romblon has not only reduced local GHG emissions, but also has socio-economic benefits. The cost for consumers to use these vehicles is approximately 0.40USD cheaper to swap the rechargeable batteries, compared to refilling one tank of gasoline. Additionally, the general integration of renewable energy generators into the local electricity grid allows the island to rely less on fossil fuel imports. The project is expected to run its pilot phase until 2023 and likely to move onto its next phase after the positive feedback and impacts it has had on the local territory thus far.<sup>16</sup>

## Case Study No. 3 | Electric Buses in Montevideo, Uruguay

In May 2020, Uruguay's capital Montevideo received 20 electric buses to service its busiest central areas.<sup>17</sup> In the midst of COVID-19, Montevideo reported an -80% change in its public transport ridership compared to pre-pandemic numbers earlier this year. Among sectors, transport was one of the highest affected in supply and demand, along with restaurants/hotels and commerce.<sup>18</sup> Still CUTCSA, Uruguay's largest public transport operator, went forward in rolling out the electric bus fleet in efforts to improve the country's transport system as it recovers from COVID-19. Electrification of transport modes is especially significant to non-oil producing countries such as Uruguay in increasing resilience and decreasing dependency on energy imports, and actually holds strong potential in generating renewable energy.<sup>19</sup> The bus fleet is intended to help fully electrify two Montevideo lines while also reducing noise and air pollution.<sup>20</sup>

Electrifying public transport is only another step toward Uruguay's robust national efforts in shifting toward renewable energy. As of early 2020, an estimated 97% of the country's electricity is sourced from renewable energy - including hydro, wind, and solar power.<sup>21</sup> This shift to renewable energy involved investments of more than 7 billion USD so far, and by 2017 Uruguay reported an 88% reduction in its GHG emissions compared to 2009-2013.<sup>22</sup> Uruguay's electric bus fleet is a prime model of how governments should not let COVID-19 impacts hinder their implementation of renewable energy in transport modes; but rather take advantage of rebuilding their transport systems to integrate low-carbon transport.

## Conclusion

These case studies mark the potential of integrating renewable energy sources in transport sectors around the globe. While targets and practices are being implemented globally, these cases especially exhibit not only renewable energy's potential to reduce GHG emissions, but that this transition can also bring positive impacts to the socio-economic infrastructure in transport. Like other practices in sustainable transport, the shift toward renewable energy's largest caveats are insufficient financial investment and bureaucratic support, such as that seen in New Delhi's solar rickshaws. Still, in the aftermath of COVID-19, governments and institutions are presented with an exceptional opportunity to make this shift into renewable energy as transport sectors worldwide recover from its effects.

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<sup>1</sup> <https://slocat.net/how-can-the-transport-sector-build-back-better-from-the-covid-19-crisis-and-what-is-the-role-of-renewable-energy-in-this-recovery/>

<sup>2</sup> <https://slocat.net/how-can-the-transport-sector-build-back-better-from-the-covid-19-crisis-and-what-is-the-role-of-renewable-energy-in-this-recovery/>

<sup>3</sup> <https://slocat.net/how-can-the-transport-sector-build-back-better-from-the-covid-19-crisis-and-what-is-the-role-of-renewable-energy-in-this-recovery/>

<sup>4</sup> [https://moovitapp.com/insights/en/Moovit\\_Insights\\_Public\\_Transit\\_Index-countries?\\_hstc=171844735.0ad591d473e285a8a5d373d5a872842f.1599242263249.1599242263249.1599242263249.1&\\_hssc=171844735.1.1599242263249&\\_hsfp=1345623360](https://moovitapp.com/insights/en/Moovit_Insights_Public_Transit_Index-countries?_hstc=171844735.0ad591d473e285a8a5d373d5a872842f.1599242263249.1599242263249.1599242263249.1&_hssc=171844735.1.1599242263249&_hsfp=1345623360)

<sup>5</sup> <https://oecd-environment-focus.blog/2020/07/24/the-challenges-of-greening-urban-mobility-in-the-post-pandemic-era/>

<sup>6</sup> [https://www.ren21.net/wp-content/uploads/2019/05/gsr\\_2020\\_full\\_report\\_en.pdf](https://www.ren21.net/wp-content/uploads/2019/05/gsr_2020_full_report_en.pdf)

<sup>7</sup> <https://www.dw.com/en/can-india-realize-its-ambitious-renewable-energy-targets/a-51085629>

<sup>8</sup> <https://www.weforum.org/agenda/2019/09/here-s-how-india-became-a-global-clean-energy-powerhouse/>

<sup>9</sup> <https://knoema.com/atlas/India/topics/Transportation/CO2-Emissions-from-transport/CO2-emissions-from-transport>

<sup>10</sup> <https://energy.economictimes.indiatimes.com/news/renewable/indian-railways-introduces-first-of-its-kind-solar-powered-train-with-battery-back-up/59593231>

<sup>11</sup> <https://www.financialexpress.com/infrastructure/railways/indian-railways-goes-green-like-never-before-from-electric-locomotives-to-use-of-solar-power-top-5-steps/1600678/>

<sup>12</sup> <https://timesofindia.indiatimes.com/city/delhi/solar-rickshaws-make-debut-on-iit-d-campus/articleshow/70299940.cms>

<sup>13</sup> <https://www.bbc.com/future/article/20200304-the-electric-vehicles-cutting-delhis-air-pollution-problem>

<sup>14</sup> <https://www.dw.com/en/can-india-realize-its-ambitious-renewable-energy-targets/a-51085629>

<sup>15</sup> <https://news.abs-cbn.com/business/01/29/19/honda-to-test-electric-scooters-wind-power-in-romblon>

<sup>16</sup> <https://docs.google.com/document/d/1M8sa02LYiL3G9bk6bZ2-GJ976oUnypB61uzDknzimdg/edit>

<sup>17</sup> <https://www.sustainable-bus.com/electric-bus/byd-electric-buses-montevideo-uruguay-cutcsa/>

<sup>18</sup>

[https://www.latinamerica.undp.org/content/rblac/en/home/library/crisis\\_prevention\\_and\\_recovery/impa-cto-social-y-economico-de-la-covid-19-y-opciones-de-politica.html](https://www.latinamerica.undp.org/content/rblac/en/home/library/crisis_prevention_and_recovery/impa-cto-social-y-economico-de-la-covid-19-y-opciones-de-politica.html)

<sup>19</sup> <https://www.sustainable-bus.com/electric-bus/byd-electric-buses-montevideo-uruguay-cutcsa/>

<sup>20</sup> <https://www.byd.com/en/news/2020-05-22/President-of-Uruguay-Launches-BYD's-Electric-Bus-Fleet-for-CUTCSA,-Uruguay's-Largest-Operator>

<sup>21</sup> <https://energytransition.org/2020/01/uruguay-latin-americas-renewable-champion/>

<sup>22</sup> <https://energytransition.org/2020/01/uruguay-latin-americas-renewable-champion/>