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CITY OF ORLANDO

TRANSITIONING TOWARDS 100% RENEWABLES WITH INNOVATIVE APPLICATION OF SOLAR PHOTOVOLTAICS



City of Orlando, USA: Facts and figures

Population

287,442 (2019)

Total area

295 km²

Municipal Budget \$1,440,937,488 (2021)

Figure 1: Map of City of Orlando, Florida, Orange County, USA Source: Google Maps, 2021

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The City of Orlando is recognized as a 'clean energy leader'. It is known as the most energy improved city in the United States for implementing various actions to support local residents and businesses in transitioning towards renewable energy along with developing energy efficient policies.

Introduction

The city of Orlando is famous for its citywide sustainability and resilient development achievements [1]. Being a major tourist destination and home to Universal Studio and Disney World, Orlando is striving towards a cleaner and greener future. Over the last decade, the city, along with its community, has launched various policies to become the most sustainable city in the southeastern USA. Situated in Central Florida, Orlando has a population of 287,442 (2019), which has increased 20.4 percent since 2010 [2]. The rapid increase in the city's population has urged the local government to establish sustainable initiatives with an immediate focus on transportation, deployment of renewable energy, building energy and water efficiency strategies.

Mayor Buddy Dyer aims at an immediate transition to energy efficient and renewable energy resources to reduce the city's GHG emissions. Although Orlando is one of the top twenty cleanest cities in the USA, it accounted for 6,994,170 tCO₂e emissions in 2019 [3]. In 2017, the City of Orlando joined ICLEI - Local Governments for Sustainability which provided technical assistance to account GHG emissions in the region. Hence, the city has a long history associated with sustainability and climate change ambitions. A noteworthy initiative, Green Works Orlando, was launched in 2007 and it has revolutionized the city by adding a 'Sustainability' chapter in the local Municipal code [4]. This initiative is mainly focused on clean energy, green buildings, local food, livability, solid waste, transportation, and water. Although the plan was launched in the last decade, it is being updated every five years by the local government.

In 2018, the local government suggested astrategicinvestmentplantowardslong-term sustainable growth that aligns cohesively with the Sustainable Development Goals (SDGs), connecting the local government's efforts to a global framework with extensive citizen engagement.

As shown in Figure 2, energy use in Orlando relies on a diverse fuel mix of coal (38%), natural gas (52.9%), nuclear (5.9%), renewables (3.2%). The share of renewable energy includes solar and landfill gas converted to energy. Solar and landfills account to 45 percent and 55 percent of the renewables share respectively. The energy sale in the city during 2020 was 6736.76 GWh. To prepare for a clean energy future, notable sustainability projects, policies, and their implementations that spark growth in the city is discussed in this case study.



Figure 2: Electricity generation in the City of Orlando by sources for the year 2020. Source: Siemens and OUC-2020-EIRP-Report (2020) [6]



City of Orlando's Climate & Energy Action Goals and Targets

Orlando's energy transition towards energy efficient, clean and renewable energy sources will mitigate the direct and indirect environmental impacts of climate change. In support of its goals, Mayor Buddy Dyer has signed the Under2 Coalition, a United Nations COP21 commitment towards reaching netzero GHG emissions by 2050. Therefore, the city has implemented the strategies listed below, that align with the Paris Agreement to limit global warming to well below 2°C above pre-industrial levels [5].

- Citywide net-zero GHG emissions by 2050 from 2007 levels with interim targets of 50 percent emissions reduction by 2030 and 75 percent by 2040.
- Citywide 100 percent clean and renewable energy by 2050, with rapid ramp-up of renewables, storage, energy efficiency, and electric vehicles (EV).
- 100 percent of city buildings meet green building standards by 2040.
- The city is committed to phasing out two coal power plants in the region no later than 2027.



The above-mentioned local targets also impact the following Sustainable Development Goals:

SDG 3 - Good health and wellbeing;

SDG 7 - Affordable and clean energy;

SDG 8 - Decent work and economic growth;

SDG 9 - Industry, innovation and infrastructure;

SDG 11 - Sustainable cities and communities;

SDG 13 - Climate action;

SDG 17 - Partnerships for the goals.

"Cities are the front lines where this transformation can happen and by leading an effort like this, we can not only help to improve the health of our residents but also help preserve natural resources, ensure environmental protection, create new jobs in the growing clean energy industry, and drive even more economic growth to our region."

Mayor Buddy Dyer, January 13, 2020 [5]

"The transition to a zero-carbon economy presents tremendous economic development opportunities for Orlando and the Central Florida region, some that we are already beginning to see stimulate our local economy, improve public health, reduce environmental impacts, and create meaningful high-wage jobs for our residents. In close collaboration with our hometown utility, OUC, and community partners, we remain committed to doing our part to advance a cleaner and more sustainable future for all."

Mayor Buddy Dyer, January 13, 2020 [REN21, 2021]



Solar Roadmap Towards caps the Achieving 100% Renewable Energy by 2050

To tackle climate change, the City of Orlando made a resolution in August 2017 to achieve 100 percent electricity consumption demand in the community with renewable sources by 2050. To accomplish this target, the city also established a goal to provide electricity in municipal operations with 100 percent renewable energy by 2030. Likewise, the City has collaborated with various stakeholders, partners, and experts to seek solutions to foster clean energy growth and climate resilience at the city level.

The partnership with the Orlando Utilities Commission (OUC) has helped Orlando to develop various renewable energy programs, such as the OUC Community Solar programs. OUC is a municipal utility company that supplies electricity and water citywide. This is one of the main reasons Orlando is rapidly decarbonizing and advancing clean energy throughout the city. Under its Clean Energy Roadmap, in 2020 OUC proposed an Electric Integrated Resource Plan (EIRP) that supports the 100 percent renewable energy generation roadmap by 2050.

In Orlando, other renewable sources (like wind, hydro and geothermal) are technoeconomically not viable, and financially not feasible. The region's topography, in addition to its hot and humid climate, make it a perfect fit to become a leader in harnessing solar energy for energy generation and consumption, as well as to provide economic opportunities for clean energy industries and green jobs. To its advantage, Orlando is a sunshine city; hence OUC's main potential relies on solar energy.

The City of Orlando is now categorized as 'solar ready' with a total solar photovoltaics (PV) installed capacity of 40.28 MWp (i.e., 184.84 Wp solar PV installed per person) [7]. OUC plays an important role in offering accessible and affordable solar energy in the city, and found innovative ways to provide solar power to citizens without the burden of initial costs for them. In February 2020, OUC made new strategic investments in energy innovation. This includes a significant budget allocated for innovation in the field of solar technologies, electric vehicles and energy storage systems until 2030. So far, OUC has committed

The city was designated as 'Solar America City' in 2010 and 'SolSmart Gold City' in 2016, the highest level of recognition by the U.S. Department of Energy Solar Energy Technologies Office [5].

\$420 million in solar PV innovation to make solar energy affordable and accessible for the future in the city. An additional commitment of \$90 million has been made in energy storage [5]. Furthermore, OUC has promised to provide 270 MWp of solar installed capacity to its citizens by 2030.

Solar Deployment Projects in Orlando

The local government is currently focusing on increasing their renewable electricity share by future solar PV installations on municipal buildings. The city owns various buildings including fire stations, parking lots, police stations, bus shelters, utility poles, football stadium, hockey arenas, and water reclaimed reservoirs. Hence, few solar pilot projects with an installed capacity of 420 kWp on Fleet & Facilities Headquarters, 12 kWp solar PV at Eola park, and 114 kWp on Inspection Services Building contribute power to municipal operations.

In pursuit of the energy transition, OUC has also developed various solar projects at a utility scale. One of the most significant solar farms is at Stanton Energy Center. With a capacity of 12.58 MWp, the **Kenneth P. Ksionek Community Solar farm** is an innovative project that was developed to increase the solar generation portfolio in Orlando. This community solar farm is the first in the country to be built atop a closed byproduct landfill. The solar panels installed at this solar farm adopt a unique patented design in a single-axis tracking system [9]. This unique design moves the panels according to the sun's position in the day, which increases the yield of solar PV by 30 percent. Additionally, it comes with a wind lock device that locks the solar tracker in a horizontal neutral position, making the whole system resilient to natural disasters like cyclones and hurricanes. Additionally, OUC recently unveiled two new solar farms of 108.5 MWp at Harmony Solar Energy Center in St. Cloud and Taylor Creek Solar Energy Center in east Orange County. With the help of 600,000 rotating solar panels, these two solar farms provide electricity to more than 30,000 homes [10]. These solar PV projects initiated by the local government are gradual steps towards achieving the 100 percent renewable energy target by 2050.

The city of Orlando, also known as an innovation hub, is a pioneer in harnessing solar energy in creative ways. In 2017, **Floating solar photovoltaics**, also named 'Floatovoltaics', with a capacity of 31.5 kWp, were first installed on a storm water storage reservoir next to the Gardenia Operations Facility. This was the first grid-connected floating solar array in the southeast USA.

Figure 3: Floating Photovoltaics at the City of Orlando. Source: Christopher Castro, Director Office of Sustainability & Resilience, City of Orlando

Figure 4: Floating Photovoltaics at the City of Orlando. Source: Christopher Castro, Director Office of Sustainability & Resilience, City of Orlando

As shown above in Figures 3-4, 'Floatovoltaics' are developed in a similar way as groundmounted panels. Panel-to-panel wiring is done to the collector box and further to the floating transmission line. An inverter is placed on the ground and this system is tested to bear the harsh 130 mph winds.

Floating Solar Photovoltaics (Floatovoltaics):

Floating solar photovoltaics systems are also referred to as 'Floatovoltaics' because they consist of modules that can float on water bodies like lakes, bays, or ponds. The formation of ice or drying of water bodies doesn't affect the installation.

Opportunities:

- The water-cooling effect provided by the water surface increases the annual output by 5-10 percent
- Eliminates the land-use problem
- Reduces the surface water evaporation
- Reduction in shading of the panels increases the efficiency

Weakness:

- Technical complexity while designing, installing, and operating
- Uncertainty about predicting environmental impacts
- Negative impacts on coral and seagrass are of concern
- Not favorable for extreme weather (i.e., high winds and waves)
- Extensive technical feasibility studies must be conducted before the installation

Facts:

- Global installed capacity is over 1.1 GWp with China being the largest player in Floatovoltaics.
- Most of the Floatovoltaics installed to date are on industrial basins, irrigation ponds, and drinking water reservoirs. However, recently they are being deployed on hydropower reservoirs providing added benefits such as higher energy yield; allowing hydropower plants to operate in 'load-following' mode rather than 'baseload' mode.
- The total capital costs for large-scale Floatovoltaics ranges between 0.94 U\$D/Wp and 1.42 U\$D/Wp depending on the location, water availability and its depth, size of the system [11].

Table 1: Levelized cost of electricity (LCOE) comparison between 50 MWp ground-mountedand floating solar PV systems [11]

| | Free Field PV | Floatovoltaics |
|---|---------------|----------------|
| Electricity produced (first year), | 75.8 GWh | 79.6 GWh |
| Increase in energy yield compared ground mounted PV | | 5% |
| LCOE (USD cents/kWh) | | |
| 7% discount rate | 5.9 | 5.6 |
| 8% discount rate | 5.2 | 5.7 |
| 9% discount rate | 5.4 | 6.0 |

Floatovoltaics are able to bear the impact of waves to a certain limit. Typically, Floatovoltaics use pontoon¹-type floats that have solar panels mounted on them at a fixed tilt angle. Solar panels are installed either on pure floats or pontoons with metal structures. The most common type is a pure float system (shown in Figure 3), in which solar PV is affixed on specially designed selfbuoyant bodies.

Figure 5: Pontoons with metal structures. Source: City of Orlando

Another type of configuration is shown in Figure 5. Here metal structures are used to support solar panels similar to groundmounted systems. This setup is then fixed on pontoons that provide buoyancy [11]. As the PV panels cover the water surface from direct sunlight, it not only reduces water evaporation but also provides a water-cooling effect, which enhances the efficiency of the solar PV. The dual benefits from water-bodies are an excellent gamechanger in harnessing renewable energy in the local region and beyond. Using storm water retention ponds to float solar PV panels is also advantageous, as it utilizes the area that is already devoid of trees, and the reflectivity of the water also increases the capacity of the solar array to a good extent. Unlike ground-mounted solar PV that uses expensive land space, Floatovoltaics limit additional costs related to land acquisition. With over 6,000 retention ponds, Orlando is now home for over 1 MWp of Floatovoltaics at various locations including the University of Central Florida, Universal Studios Florida, and Altamonte Springs Wastewater Treatment Plant.

In December 2020, the city unveiled new Floatovoltaics at Orlando International Airport. This technology showcases a unique application of solar energy that has positioned the city at the forefront for its creativity, innovation, and sustainability. With abundant sunlight, power generation from Floatovoltaics has huge potential.

¹ Floats (also called pontoons) are airtight hollow structures, similar to pressure vessels, designed to provide buoyancy in water.

This innovative approach is estimated to yield \$115,000 in recurring annual savings and more than \$2 million over the solar array's lifespan [12].

The U.S. Department of Energy granted \$1 million to OUC to conduct research and development on the performance and aquatic impacts of Floatovoltaics, in collaboration with the National Renewable Energy Laboratory (NREL) [13]. Several studies show that Floatovoltaics are favorable for irrigation and drinking water reservoirs², however covering them on the entire lake must be avoided as sunlight penetration is essential to support aquatic ecology and water quality. Shading of natural lakes can change the fauna, flora interaction with microclimate [17]. Hence, the grant helps to research location-specific performance, durability, and environmental impacts of this fairly new technology.

Other implications from the electromagnetic field caused by the installation of cables should also be assessed before the installation.

Another creative approach to using solar energy in Orlando is the installation of **solar** sculptures [9]. As shown in Figure 6, planting solar trees at key locations in the city helps to raise public awareness about the benefits of utilizing solar energy for power generation. Recently in 2020, new solar sculptures called "Gyration" (as shown in Figure 7) were installed in the city's soccer stadium. These solar-powered sculptures are connected to OUC's grid, offsetting their electricity demand during the night for net-zero carbon output. Additionally, OUC has also installed solar PV on bus shelters and utility poles in the city, which is also used to offset the use of EVs in Orlando.

Figure 6: Solar tree installed at Convention Center, Orlando. Source: Orlando Utility Company (OUC).

Figure 7: Soccer ball shaped solar sculpture: 'Gyration' installed outside Exploria Stadium, Orlando. Source: Orlando Utility Company (OUC).

² Irrigation and drinking reservoirs are man-made that store water and do not support aquatic ecology as natural lakes.

Solar Cooperative Purchasing Program (Solar Co-Ops)

Solar Co-Op is a community of home owners who would like to make a switch to solar energy systems. Fifty to a hundred neighbors join together and select a single installer (group purchasing) to ensure they are given the best prices for installing rooftop solar PV. Since 2016, Orlando has been hosting solar cooperatives each year for residents who leverage bulk-pricing power to get quality installation with discounted prices. This community approach not only ensures competitive solar installation, but also creates jobs in the RE sector. Facilitating Solar Co-Ops in Orlando inspires the public toward cleaner energy transition.

| Average costs of installation (Actual system sizes may vary) | 4 kW | 8 kW | 12 kW |
|---|-----------|-----------|-----------|
| Average solar price (\$2.25/W) | \$9,000 | \$18,000 | \$27,000 |
| Federal tax credit (26%) | \$ -2,340 | \$ -4,680 | \$ -7,020 |
| Net Cost | \$6,660 | \$13,320 | \$19,980 |
| Estimated 1 year savings | \$700 | \$1,300 | \$2,000 |
| Estimated 10 year savings | \$7,200 | \$14,300 | \$21,500 |
| Estimated Life Savings (25 years) | \$20,100 | \$40,200 | \$60,300 |
| Payback Period (months) | 113 | 121 | 120 |
| Net Profit | \$13,440 | \$26,880 | \$40,320 |

Table 2: Average costs for installing solar PV systems in Orlando under Solar Co-Ops [14]

Solar Energy Financing Scheme by Orlando's Local Government

The local government has a direct influence in jumpstarting solar energy growth by setting ambitious goals and permitting solar-friendly initiatives. Additionally, the local government is known for ramping up solar energy through various technologies and financial tools for the residential and commercial sectors. For instance, Solar Energy Loan Funds (SELF) and Property Assessed Clean Energy (PACE) provide funding to reduce the upfront costs required to refurbish buildings with sustainable property improvements [5].

Other than SELF and PACE financing programs, the city has also initiated several other financial tools (as listed in Table 3) to help the energy transition. Until 2021, the major financial incentive available is the 26 percent federal solar tax credit [15].

SELF: Helps residents - especially low-income families - by providing a loan amount of up to \$50,000 to renovate into a greener and more sustainable property, with interest rates as low as 5 percent for 3-7 year terms [20]. Home energy improvement plans include energy efficiency and renewable energy projects [e.g. high efficiency air conditioning; tankless water heaters; solar attic fans, solar water heaters, solar air conditioners (AC) (excluding solar PV)]. They provide a higher standard of living to residents, along with reducing their carbon footprints. Passive housing through this plan is an important step towards environmental justice and energy independence.

PACE: Provides financing with no upfront costs, through funding provided by state approved third-party administrators, with interest rates ranging between 6-9 percent [19].With the help of PACE, homeowners and business owners can substantially reduce utility bills by improving energy and water efficiency of the buildings [18]. A few examples include: providing hurricane protection, high efficient heating and cooling systems, water conservation, EV charging stations, seismic upgrade storm shutters, and solar systems.

| Incentive program | Eligibility | Туре |
|---|-------------|------------------------|
| Residential Renewable Energy Tax Credit | Federal | Personal Tax Credit |
| Solar and CHP Sales Tax Exemption | State | Sales Tax Incentive |
| PACE Loans | State | Loan Program |
| Property Tax Abatement for Renewable Energy Property | State | Property Tax Incentive |
| SELF Loans | State | Loan |
| Net Metering | State | Net Metering |
| Solar and CHP Sales Tax Exemption | State | Tax incentive |
| Florida Keys Electric Cooperative - Solar Loan Program | Utility | Loan Program |
| Orlando Utilities Commission- Residential Energy Efficiency Rebate Program | Utility | Battery Rebate |

Table 3: Incentives, Tax Credits and Rebates Available for Orlando Residents [16]

Key Findings

Decade-long commitments towards а sustainable future through Green Works Orlando have strategized its long-term commitments. Over the years, the city has made tremendous progress in implementing various sustainability practices. Orlando leads by example and aims to achieve city-wide carbon neutrality by generating electricity from 100 percent clean and renewable sources by 2050. For a few decades, the city of Orlando has been vulnerable to climate change impacts like storms, wildfires, and a rise in local temperatures. These problems have motivated the city to set a long-term goal of eliminating GHG emissions. This initiative encourages the deployment of cost-saving renewable energy generation solutions, along with the reduction in GHG emissions. With the higher solar potential in the region, the only resources within the technology mix for the city by 2050 are solar and storage technologies.

In collaboration with OUC, accelerated solar deployment through city-wide solar projects are currently witnessed. The extensive harnessing of solar energy through largescale solar projects, along with shifting residential and commercial users towards solar PV systems is taking place under the local action plan. This is being accomplished through education, improved management of operational practices, new policies for the purchase of electrical equipment, energy audits for existing buildings and plants, installation of new efficient technologies in buildings, plants, and infrastructure, exploration of renewable energy sources.

Additionally, the city's decision-makers have a strong policy focus on transitioning to renewables by making them the cheapest option available. Furthermore, citizen engagement plays an important role for the municipal-owned utility, ensuring the energy transition to renewables. OUC held several citizen and community engagement programs for consultation on target setting and strategy, and to share best practices for implementation pathways that are beneficial for both parties.

Next to citizen engagement, clear, long term and reliable policies and increased energy independence are also the motivators towards achieving a 100 percent renewable energy transition. Several financing programs for community-oriented energy efficiency upgrades and solar installations help the residents - especially low-income families by providing accessible, and affordable clean energy. The soft costs (such as installation costs, permits and grid access involved in the installation of solar PV) are usually covered by incentive initiatives that have driven such widespread deployment.

Since 2016, Orlando has been hosting solar cooperatives each year to provide financial benefits to customers. Net profit gained through solar installation is significant. In Orlando, homeowners can save around \$40,320 over 25 years. Through innovative local financial initiatives such as SELF and PACE, Orlando promotes the goal of equity and accessible energy to residents, specifically targeting low-income households. These incentive programs eliminate the lack of upfront capital as a key barrier in pursuit of achieving the city's renewable energy goals.

If the city governments have a robust local climate policy like Orlando, it would accelerate the clean energy transition. Financial and fiscal policies create a demand for clean energy solutions, and if enough local governments implement such initiatives, renewable energy solutions can be widely adopted.

References

[1] City of Orlando. Official website: <u>http://www.cityoforlando.net/blog/40-fun-orlando-facts/#:~:text=The%20City%20of%20Orlando%20has%20had%20various%20</u>nicknames%20throughout%20its,known%20as%20The%20City%20Beautiful.

[2] Ryan Lynch and Susan Lundine (2020). 'These towns and cities are contributing the most to Central Florida's population boom'. Orlando Business Journal. Available: <u>https://www.bizjournals.com/orlando/news/2020/06/01/heres-where-city-sits-for-population-growth.html#:~:text=Still%2C%20Orlando%20has%20posted%20double,towns%20 in%20the%20Orlando%20metro.</u>

[3] Liz Kennedy (2020). '50 Cleanest (Dirtiest) Cities in America'. Reader's Digest. Available: https://www.rd.com/article/50-cleanest-dirtiest-cities-in-america/

[4] City of Orlando. Official website: <u>https://www.orlando.gov/Our-Government/</u> Departments-Offices/Executive-Offices/CAO/Sustainability-Resilience

[5] Community Action Plan (2018). Available: <u>https://www.orlando.gov/Initiatives/2018-Community-Action-Plan</u>

[6] Siemens and OUC-2020-EIRP-Report (2020). Available: <u>https://oucroadmap.com/</u>wp-content/uploads/2020/11/Siemens_OUC-2020-EIRP-Draft-Report_11.09.2020.pdf

[7] Shining Cities 2020. 'The Top U.S. Cities for Solar Energy'. Available: <u>https://environmentamerica.org/feature/ame/shining-cities-2020</u>

[8] OUC - The Reliable One. 'OUCollective Solar'. Official website: <u>https://www.ouc.com/</u> environment-community/ouc-solar-solutions/oucollective-solar

[9] OUC - The Reliable One. 'Solar'. Official website: <u>https://www.ouc.com/environment-community/green-initiatives/renewables/renewables-solar</u>

[10] Matthew Moyer (2020). 'OUC flips the switch on new solar farms in Orange and Osceola County'. Orlando Weekly. Available: <u>https://www.orlandoweekly.com/Blogs/</u> archives/2020/07/01/ouc-flips-the-switch-on-new-solar-farms-in-orange-and-osceolacounty#:~:text=On%20Tuesday%2C%20Orlando%20Utilities%20Commission,new%20 sources%20of%20renewable%20energy.

[11] International Bank for Reconstruction and Development / The World Bank, Where Sun Meets Water – Floating Solar Market Report (2019). Available: <u>http://documents1.</u> worldbank.org/curated/en/579941540407455831/pdf/Floating-Solar-Market-Report-Executive-Summary.pdf

[12] AEU Solar Array Information Sheet. Available: <u>http://www.altamonte.org/</u> <u>DocumentCenter/View/8800/AEU-Solar-Array-Info-Sheet</u>

[13] Sherri Shields (2019). 'UCF Leads National Team to Study Floating Solar'. UCF Today. Available: <u>https://www.ucf.edu/news/ucf-leads-national-team-to-study-floating-solar/</u>

[14] Solar United Neighbours. Official Website: <u>https://coops.solarunitedneighbors.org/</u> coops/orlando-solar-co-op-2

[15] Solar Reviews. Available: <u>https://www.solarreviews.com/blog/federal-solar-tax-credit</u>

[16] Solar Reviews. Available: <u>https://www.solarreviews.com/going-solar-with-orlando-utilities-commission</u>

[17] Gardenio Diogo Pimentel Da Silva & David Alves Castelo Branco (2018). 'Is floating photovoltaic better than conventional photovoltaic?' Assessing environmental impacts. DOI: 10.1080/14615517.2018.1477498

[18] City of Orlando. 'Orlando's PACE financing programs' Available: <u>http://www.cityoforlando.net/greenworks/pace/</u>

[19] Florida PACE Funding Agency. Official website: https://floridapace.gov/about-pace/

[20] SELF Solar loans. Official website: https://solarenergyloanfund.org/

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The 100% Renewables Cities and Regions Roadmap project facilitates the energy transition by raising local awareness on renewable energy sources, showcasing how local and national governments can create coordinated enabling frameworks and policies, exploring access to public and private sector finance, and building local renewable energy projects to address electricity, heating and cooling.

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