

# FortZED Fort Collins

Fort Collins, CO, USA 



## FortZED Fort Collins

**FortZED (Fort Collins Zero Energy District) focuses on the downtown area of Fort Collins and aims to transform it into a zero energy district. On the path to a better energy future, FortZED combines technology developed by university researchers, city utility experts and businesses. The project offers a testing ground to experiment with new sustainable energy technologies thus supporting Fort Collins in its movement towards a more efficient and sustainable future. Specific aims of FortZED are to increase renewable energy production, to improve energy efficiency, to manage peak energy usage and to adapt smart grid solutions [1]. The project has several programmes to follow in order to achieve its aim.**

### Country/ City Profile



Country		City	
Population (2015)	321,442,019 [2]	Population (2014)	156,480 [2]
Land area (km <sup>2</sup> )	9,831,510	Land area (km <sup>2</sup> )	122.1
GDP per capita (2014, US\$, at purchasing power parity)	54,421 [2]	GDP per capita (2014 median household income \$)	53,775 [2]
Region	North America	Region	Colorado, Larimer County Seat

### City's physical geography

Location	<ul style="list-style-type: none"> <li>✓ Located on the Cache La Poudre River along the Colorado Front Range</li> <li>✓ 105 km north of Denver - state capital -</li> <li>✓ Middle sized college city - Colorado State University -</li> </ul>
Climate	<ul style="list-style-type: none"> <li>✓ Semi-arid climate and low annual precipitation</li> <li>✓ Summers range from mild to hot, with low humidity and occasional afternoon thunderstorms</li> <li>✓ Winters range from mild to moderately cold</li> <li>✓ The average temperature reaches 22°C in July and -2°C in January</li> </ul>

### Initiating context

FortZED focuses on the downtown area of Fort Collins and aims to transform it into a zero energy district. The idea came up in 2007 by an initiative of the Community Foundation of Northern Colorado, UniverCity Connections. Fort Collins downtown area is responsible for 10-15% of total energy demand of Fort Collins. The project aims to improve energy conservation and energy efficiency and to increase the use of renewable energy sources and smart technologies. Local renewable energy sources such as wind, solar PV and biomass are aimed to form the main source of energy supply. Fort Collins has always been front-runner in terms of energy conservation and energy efficiency in the country. The vision of the project aims to advance this trend of the community with collaboration of technical expertise, civic leadership, higher education and community participation [3].

### Project description

FortZED is an energy project that creates an area for new and innovative ideas to be tested and implemented in the downtown area of Fort Collins. The project brings together technical expertise, civic leadership, higher education and community to work on an efficient and sustainable future. The initiative focuses on advanced energy solutions for a better energy future. The project develops new technologies for energy sources that are local and renewable, integrates them into the power distribution system and manages demand response as well [1]. Since the launch of the project, e.g., already several buildings have been retrofitted with energy efficient technologies and a

“Renewable and Distributed Systems Integration (RDSI)” project has been developed, aiming to enable intelligent energy management within the district [1,3].

## Implementation process

### Projects implementation details [1]

<b>Process</b>	Implementation of measures which aim to: <ul style="list-style-type: none"> <li>✓ Increase renewable energy production</li> <li>✓ Improve energy efficiency</li> <li>✓ Manage peak energy usage</li> <li>✓ Reduce greenhouse gas emissions</li> <li>✓ Transition to cleaner transportation fuels</li> </ul> Innovations on: <ul style="list-style-type: none"> <li>✓ Electricity</li> <li>✓ Heating and Cooling</li> <li>✓ Alternative Transportation Fuels and Systems</li> <li>✓ Behavioural Systems</li> <li>✓ Financial Systems</li> <li>✓ Business Models</li> </ul>
<b>Leadership</b>	<ul style="list-style-type: none"> <li>✓ The City of Fort Collins</li> <li>✓ Colorado Clean Energy Cluster</li> <li>✓ Colorado State University</li> </ul>
<b>Financing</b>	<ul style="list-style-type: none"> <li>✓ U.S. Department of Energy</li> <li>✓ Community Foundation of Northern Colorado</li> <li>✓ Bohemian Foundation</li> <li>✓ New Belgium Brewing Co.</li> <li>✓ Fort Collins Downtown Development Authority</li> <li>✓ Colorado Governor's Energy Office</li> </ul>
<b>Involved stakeholders</b>	Technology Partners and Providers <ul style="list-style-type: none"> <li>✓ Brendle Group</li> <li>✓ Spirae</li> <li>✓ Woodward Inc.</li> <li>✓ Advanced Energy Industries</li> <li>✓ Eaton Corporation</li> <li>✓ CSU Energy Institute</li> <li>✓ Integrid Test and Development Laboratory</li> <li>✓ VanDyne Super Turbo</li> </ul> Site Partners <ul style="list-style-type: none"> <li>✓ City of Fort Collins Operations Services</li> <li>✓ CSU Facilities Management</li> <li>✓ Larimer County Facilities</li> <li>✓ New Belgium Brewing Co.</li> </ul>

## Results

The project has connected residents, businesses and organizations as a platform that brings innovative technologies into citizens' life. The measures have contributed to energy sustainability and increased quality of life. The transparency in the project made all participants and citizens see the results of their efforts and realize the progress [1].

The ClimateWise programme which has been implemented in the course of the FortZED project e.g. has saved 12 million \$ by implementing efficiency upgrades, and has avoided 82,000 tons of CO<sub>2eq</sub> emissions. Under the ClimateWise programm specific companies have undertaken following measures [1]:

- ✓ Changing light bulbs to LED lights - reduction of 281,000 kWh electrical use (Partner: Dellenbah Motors)
- ✓ Installation of more efficient parking lot lights - decreased costs by 50% (Partner: Fort Collins Marketplace)
- ✓ Implementation of a behavioral change challenge to staff - reduction of 32.7% in energy use (Partner: VFLA and Ripley Design)

- ✓ Replacement of old 190 ton water chillers to efficient 200 ton chillers - doubled the capacity and saved 3000\$/year (Partner: Advanced Energy)

### Lessons learned

The City of Fort Collins is a good practice example in terms of the collaboration of all stakeholders of the city, professionals, companies and innovations in the project. The city aims to achieve a better energy future by increasing renewable energy production, improving energy efficiency, managing peak energy usage, reducing greenhouse gas emissions and transitioning to cleaner transportation fuels. As good practice example, the project also leads other cities to a zero energy future. Further it contributes to economic and public health, creates opportunities for high skilled workers and attracts investments of big companies [1].

### References

- [1] <http://fortzed.com>
- [2] <http://www.census.gov/>
- [3] [http://www.rmi.org/summer\\_2013\\_esj\\_whats\\_old\\_is\\_new\\_main](http://www.rmi.org/summer_2013_esj_whats_old_is_new_main)

### Author/ Contact

İTÜ



© Istanbul Technical University

Faculty of Architecture

Taskisla/Beyoglu/Istanbul

<http://www.itu.edu.tr/>