Jan. 2, 2018

Dear Lori,

Please include the following information in the Council packet of information for our Jan. 9, 2018 City Council meeting.
Thank you,
Mitzie

Conservation Design and Development Considerations

Intent OS 1.10 - Conservation Design and Development Considerations

The City will implement design and development strategies in the City's Land Development Code and review processes that reduce the negative effects of development on water, energy, natural resources, global, and climate impact.

Strategy OS 1.10.1 - Land Development Code Considerations

The Land Development Code and review processes will include the following conservation design and development considerations:

1. Green Building Strategies
2. Tree resources
3. Landscaping
4. Low impact site and development practices
5. Water and groundwater resource protection and conservation
6. Natural drainage channel protection
7. Location, control, and monitoring of pollutants and hazardous substances
8. Runoff filtration and treatment
9. Impervious surfaces

Mixed Use Residential Districts

Strategy OS 1.11.1 - Mixed Use Residential District Requirements

The City shall require open space components in Mixed-Use Residential designated areas. Within the Land Development Code, the City shall require:

1. A minimum of 50 percent of the gross land area, on a per property (development) basis shall be provided as Open Space. Open spaces shall not be less than a minimum 10 percent conservation or a minimum 10 percent functional. These percentages may vary based on site conditions.

2. Functional open spaces
   a. Amenities/recreation
   b. Design characteristics consistent with the architectural character and landscape features
      i. Type and function of resources
      ii. Location of resources in relationship to other amenities, residential dwelling units, and park or public space facilities both within the development and the surrounding area
      iii. Resource plan that incorporates the facility design, types, size, location, and sidewalk access, into an overall development plan; issues to be addressed by this plan include mobility features, pedestrian accessibility and connectivity, architectural standards, and landscaping/hardscaping components
      iv. Accessibility to open spaces

3. Conservation open spaces
   a. Design characteristics consistent with the landscape features
   b. Conservation initiatives
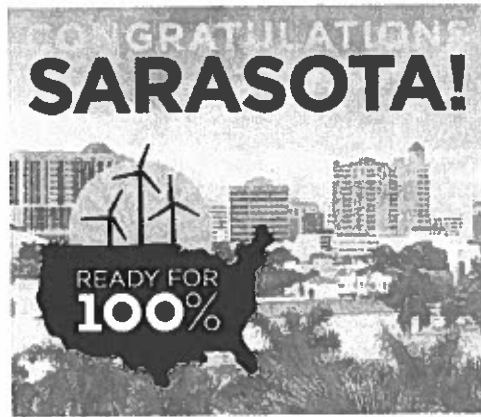
Quick Facts

Regional Impact of Burning Fossil Fuel

- 6" – Sea level rise by 2040[1]

- 60 – Additional days above 95°F[1]

- #2 – In highest number of air pollution days in the state[2]

Regional Impact of Going Renewable with Solar

- $1.69 billion – direct sales in 2016 created by Florida Solar Industry[3]

- 19,000 jobs – The solar industry's impact in Florida[3]

- $1.03 billion – Solar salaries, wages, and benefits paid in 2016[3]

- $1.7 billion – to GDP for Florida in 2016[3]

- 1 solar-related job supports 1.34 jobs elsewhere in the Florida economy[3]

- $1 spent on solar generates an additional $0.90 in spending throughout the state[3]

- 26% – Increase in solar jobs from 2015 to 2016[3]

- 1 in 25 – Workers employed by solar industry Florida[3]

- 67% - Decrease in cost to install solar PV since 2011[4]

- 84 seconds – How often a solar PV system was installed in 2016[4]

1) NOAA National Climatic Data Center
(2) Environment Florida Research & Policy Center
(3) The solar foundation, solar-jobs-census economic-impacts-report-2016
(4) SEIA

@SarasotaClimateJustice

For more information contact: Lynn Nilssen at lynnsierra@nilssen.com

Ready for 100

Affordable healthy energy is here. It's time for local and national leaders to commit to 100% clean and renewable energy for all. *#ReadyFor100* is a movement of people working to inspire decision-makers across the country to embrace a vision of healthier communities powered by 100% clean energy.

A transition to renewable energy and energy efficiency presents one of the greatest economic opportunities of the 21st century.

- **Clean energy saves money:** Stanford scientists say the transition to 100% clean energy will save the average family over $200 dollars per year in energy costs and another $1,500 per year in health care costs.[1]

- **Clean energy creates good-paying jobs:** The solar industry already employs over 200,000 people, nearly twice as many people as the coal mining industry! Solar jobs grew 12 times faster than the overall economy this year.[2]

- **Clean energy protects health & climate:** Fossil fuels are a leading source of air and water pollution. Air pollution caused by energy production in the U.S. caused at least $131 billion in damages in the year 2011 alone[3] with costs resulting from pollution-induced early mortality, illness, health care costs and lost productivity.

Nationally the transition to 100% clean energy is already happening. Cities and businesses are leading the way. Dozens of U.S. cities, including Boulder, CO, San Diego, CA and Georgetown, TX are going all-in on clean energy. Additionally, 55 countries around the world, including Canada, already get over half their energy from renewable sources. With renewable energy prices on the decline, the time is now. Solar prices have fallen 80% in recent years and wind prices have fallen 60%. Renewable energy is cheaper than coal and gas in many places and is the fastest growing energy source in the world.[4]

WHY 100%?

- It is both technologically and economically feasible to transition the U.S. and the globe to 100% clean, renewable energy by 2050.

- The local clean energy movement can create an economic stimulus that would reinvigorate local communities.

- Solar allows individuals and communities to have a voice in their own energy future through homegrown solutions.

The Ready For 100 campaign is asking mayors, CEOs, pastors, principals, civic and community leaders, parents and students to **commit to solutions that help us achieve** an equitable, democratic and decentralized 100% clean, renewable energy system in the U.S. by 2050.

1. Mark Z. Jacobson. 100% clean and renewable wind, water, and sunlight (WWS) all-sector energy roadmaps for the 50 United States. Energy and Environmental Sciences, Volume 8, 2016, pages 2093-2117. http://web.stanford.edu/group/efmh/jacobson/Articles/I/USStatesWWS.pdf
2. National Solar Jobs Census 2015, The Solar Foundation. tsfcensus.org
3. Jaramillo and Muller. Air pollution emissions and damages from energy production in the U.S. 2002-2011. Energy Policy, Volume 90, March 2016, pages 202-211. http://dx.doi.org/10.1016/j.enpol.2015.12.035
4. International Energy Outlook 2016, U.S. Energy Information Administration. http://www.eia.gov/outlooks/ieo/pdf/0484(2016).pdf

READY FOR 100%

Florida
SOLAR JOBS CENSUS 2016

There were **260,077 solar workers** in America in 2016, a **25 percent increase** over a single year, based on data collected for The Solar Foundation's annual *Solar Jobs Census.* Visit *SolarStates.org* to view an interactive map of solar jobs in 2016 by state, county, metro area, and congressional district—and more.

State Solar Jobs

8,260 Solar Jobs

5 State Ranking for Number of Solar Jobs Nationwide

31 State Ranking for Solar Jobs Per Capita

1,700 **New Solar Jobs**, 2016
26% **Solar Jobs Growth**, 2016
12% **Projected Solar Jobs Growth**, 2017
9% **Veterans in State Solar Workforce**, 2016

Solar Jobs by Sector
(Change from 2015)

| Installation	Manufacturing	Sales/ Distribution	Project Development	Other
3,933	**1,021**	**945**	**1,936**	**424**
(22% increase)	(39% increase)	(111% increase)	(2% decrease)	(129% increase)
↑	↑	↑	↓	↑

Solar Industry Context

15 State Ranking for Installed Solar Capacity

Enough Solar to Power **69,653 Homes**

393 Solar Companies

How Solar Workers Spend Their Time

82% Residential Solar
12% Commercial Solar
7% Utility-Scale Solar
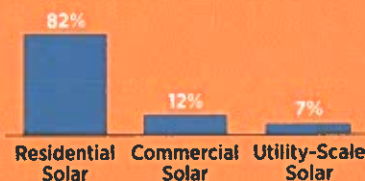
Solar Policy Context

B Net Metering Policy Grade

D Interconnection Policy Grade

N/A Renewable Portfolio Standard Target

N/A Renewable Portfolio Standard Solar Carveout

20 State Ranking for Average Electricity Price (Highest to Lowest)

Solar jobs grew 10 times faster than the overall state economy in 2016.
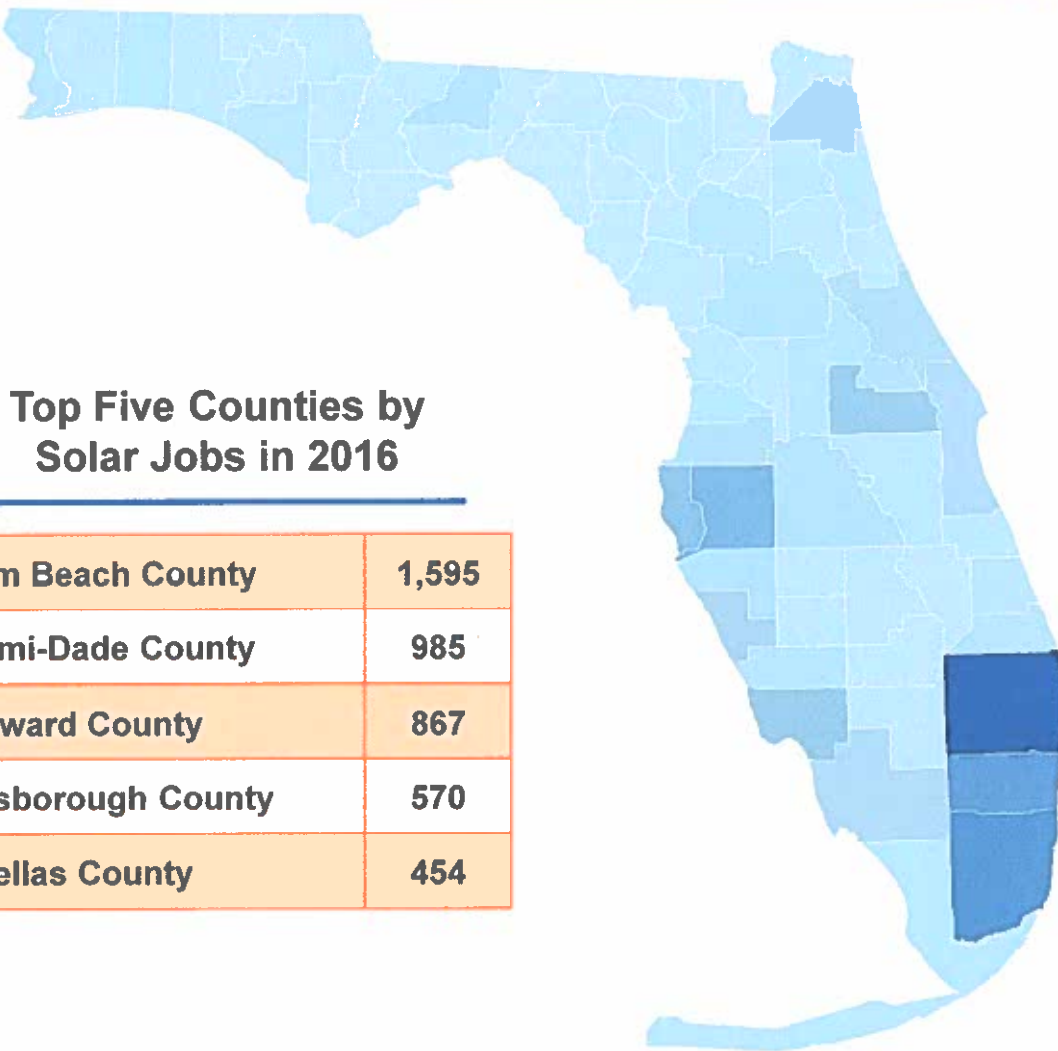
SolarStates.org

The **SOLAR FOUNDATION™**
for a bright future

Florida
SOLAR JOBS CENSUS 2016

With 8,260 solar workers, the solar industry in Florida produced $1.69 billion in direct sales in 2016. When direct, indirect, and induced jobs are included, the solar industry's impact in Florida exceeded 19,000 jobs. These jobs paid more than $1.03 billion in salaries, wages, and benefits and added $1.7 billion to Florida's GDP in 2016.

Top Five Counties by Solar Jobs in 2016

Palm Beach County	1,595
Miami-Dade County	985
Broward County	867
Hillsborough County	570
Pinellas County	454

SolarStates.org

Achieving an Equitable and Just Transition to 100% Clean, Renewable Energy

Guidelines and Recommended Actions for U.S. Communities

Table of Contents

Acknowledgements

As a member of the Global 100% Renewable Energy Campaign, our guidelines and recommended actions for achieving a 100% renewable energy align with the international 100% Renewable Energy criteria, while also taking into consideration Sierra Club energy policies, and local and regional factors.

Thank you to the following organizations for their review and input on this document:

Renewable Cities
Center for Social Inclusion
ICLEI
Institute for Sustainable Communities
Meister Consulting Group

Introduction

The time for 100% clean, renewable energy has come. For too long, low income communities and people of color have borne the burdens of dirty energy in our communities. Rural and suburban workers are witnessing closure of coal plants due to market trends. And from mega-storms to drought and wildfires, communities across the country are beginning to experience the severe impacts of climate change. Local municipal leadership is necessary to shepherd the U.S. towards climate change mitigation and resilience. Numerous studies show that it is possible to eliminate fossil fuels around the globe by the year 2050. Studies of the U.S. align with this global finding and show it is technologically and economically possible to achieve 100% clean energy across the country by 2050 or even sooner. The challenge of this century is to transition to 100% clean, renewable energy in the United States and across the globe. Converting our energy sources to 100% renewable, sustainable energy is critical step in achieving the Greenhouse Gas reductions necessary to avoid the worst impacts of climate change. While not a simple transition, it is one we must pursue now in order to accomplish this transition in time.

As a member of the Global 100% Renewable Energy Campaign, our guidelines and recommended actions for achieving a 100% renewable energy align with international criteria, while also taking into consideration Sierra Club energy policies, and local and regional factors.

What is a 100% Renewable Energy Community?

Local or regional governments can show leadership in our transition to 100% renewable energy by setting a target to move the entire community to 100% clean, renewable energy and then actively pursuing a path towards implementation. A number of communities have already achieved this 100% renewable electricity, and many others have adopted strategies to move towards meeting 100% of their electricity, transportation, and heating and cooling needs from renewable energy sources . It can also refer to jurisdictions that have exceeded the 100% Renewable Energy benchmark for their community and become exporters of renewable energy.

A community-wide 100% goal should be realistic, time bound, developed in partnership with the community, and accompanied by plausible implementation measures. It must also take into account the imperative to move off of fossil fuels as a nation no later than 2050. A 100% goal is fully achieved when the amount of energy generated from renewable energy sources in the community (or brought into it) equals or exceeds 100% of the annual energy consumed within

1

that community. Guidelines and recommended actions for what a community-wide commitment
to an equitable and just transition to 100% clean and renewable energy are outlined below.

Guidelines

Guideline 1: Efficiency First

Reducing the amount of energy used to power our economy and scaling up energy efficiency is
essential to empowering a 100% clean energy future for all, and will make reaching that target
easier and more cost effective. Determining the potential for energy efficiency and energy
savings are a critical first step to implementing a 100% clean energy strategy. Before
determining how much renewable energy is needed, first assess how the present energy
demand can be reduced significantly. Strategies to enhance energy efficiency and energy
savings technologically include weatherization, cogeneration, district heating and cooling,
decentralized electricity generation and smart grids/microgrids, the use of industrial waste heat,
building controls, automated lighting, and solar-powered hot water heaters. Cities should also
pursue non-technological measures that enable behavior shifts (e.g. electricity saving
campaigns) and creating a culture of energy saving behavior.

For research, policy analysis, and expert guidance on energy efficiency go to the American
Council for an Energy-Efficient Economy (ACEEE)

Guideline 2: Equitable and Just

The transition to 100% renewable energy can bring a wealth of community benefits, particularly
to those who are most vulnerable. Transitioning our energy systems entirely to renewable
energy presents an unprecedented opportunity to address inequality and lift up those most
impacted by climate change and fossil fuel extraction, infrastructure, and combustion. The
transition to renewable energy can be a vehicle to decentralize and democratize our energy
infrastructure, reduce and stabilize costs, create jobs, improve grid reliability, and distribute the
economic benefits of generating energy more equitably. For examples, cities have been able to
reduce electricity cost to consumers by integrating solar panels into their electrical generation
mix. In order to achieve these benefits, we must be intentional and steadfast in integrating
solutions to these challenges into the transition plan.

A transition to 100% renewable energy should include policy mechanisms and financial
incentives that enable the following principles:
- **Create Quality Careers** for all people employed in clean energy industries. Local clean
  energy transitions must create local jobs that are self-determined by community
  members and community needs. Jobs created from cities transitioning to clean energy
  should be quality, fair-salary or unionized jobs that prioritize employing the often

non-traditional workers in clean energy programs, and people from traditionally marginalized backgrounds.

- **Provide a Just Transition** that protects the livelihoods and well-being of fossil fuel workers and communities. Communities whose primary economic driver has been the fossil fuel industry, that have borne the polluting brunt of fossil fuel production and/or workers currently employed by the fossil fuel industry - deserve protection, support and right to first access of new economic opportunity during a nationwide energy and economic transition to 100% renewables. Cities should address the needs of workers by engaging community-leadership and voices throughout the design and implementation of the transition plan.
- **Ensure Equitable Access** to clean-energy-related economic opportunities (including careers, wealth, and clean energy infrastructure) for vulnerable communities and individuals especially working class and low-income people, people of color, women, and youth. Regulatory models should prioritize ownership and benefits of the new energy system for people of identities that have been historically marginalized by the fossil-fuel economy.
- **Provide Affordable Clean Energy Options**, especially for members of vulnerable communities. A city transition plan should prioritize financing models that enable all income brackets and business sizes to choose 100% clean energy renewable energy The transition plan should secure community benefits and cost affordability of utility-scale renewable energy alongside growth in locally-owned, affordable options for distributed energy. Public financing programs should redirect money saved from energy efficiency measures to fund more community-owned clean energy and transportation projects, especially in communities with greater financial need.

Guideline 3: Clean and Renewable

Clean, renewable energy is defined as carbon and pollution free energy sustainably collected from renewable sources including wind, solar, tidal, and geothermal. Low-impact, small hydro and some forms of biomass may be included after being evaluated for sustainability and environmental justice implications. Nuclear, natural gas, coal, oil based, or any other forms of carbon-based energy production are not included as clean or renewable sources of energy.[1]

Guideline 4: All Sectors: Electricity, Heating and Cooling and Transportation

A community's 100% commitment should aspire to transition all energy sectors, including electricity, heating and cooling, and transportation. It is likely your community will be able to transition one sector faster than others, though the vision for the transition to 100% should encompass all types energy use in the city. One recommended approach is to set a goal of transitioning all energy sectors by 2050, with shorter-term targets for the sectors that can be

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[1] Full details on Sierra Club's energy policies can be found at http://www.sierraclub.org/policy/energy

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transitioned sooner. If it is not feasible to set a goal for all energy sectors, begin by establishing a goal to transition the electricity sector.

Guideline 5: Community-Wide

A number of communities have set (or achieved) goals to supply all the energy used by their municipal facilities or operations with renewable energy. Powering municipal operations with 100% renewable energy can be an important milestone on a city's path to 100% clean energy, but a municipal target alone does not achieve the scale necessary to address social and environmental threats facing us.   A strong commitment to 100% clean, renewable energy is one that commits to transitioning the entire community to 100% renewable energy (in other words, it covers all energy used within a city-limits). Some cities are taking this on for their jurisdiction and others are working in cooperation with surrounding communities.

Guideline 6: Inclusive and Transparent Process

In order to successfully achieve an equitable and just transition to 100% clean, renewable energy, it's critical to develop and implement the commitment through inclusive and transparent processes. Individual citizens, local community organizations, public institutions, and small and large businesses must work in tandem to form the new system. Realizing just solutions requires inclusive policy processes and soliciting input from all of a community's diverse stakeholders on their needs and ideas. It also requires assessing and defining those populations most likely to be impacted by environmental problems and related climate and energy policies. This involves prioritizing a range of public participation opportunities and listening to and learning from people under-represented in decision-making processes and those who experience forms of discrimination and inequality.

Guideline 7: Include an Ambitious Target for Local and Distributed Energy

There is a tremendous amount of untapped renewable energy potential on rooftops and underutilized open space within the city-limits of our communities. Local, distributed energy provides a number of benefits to the community. It increases grid security and reliability, grows the local economy, creates new jobs, and provides an opportunity to increase local ownership of these assets and spread the economic opportunities of transition to clean energy across the community. A community's 100% commitment should incentivize a diversity of local investment and procurement options, and be coupled with standards for local hiring, workforce development, and options community ownership.

4

Recommended Actions

Action 1: Announce a Visionary Target

A statement or proclamation of 100% clean, renewable energy by a city leader is important to mark the beginning of a city's commitment to craft a strategy that moves it off of fossil fuels. It serves as a call to action to motivate local stakeholders, begin a conversation, and build a common vision of the city's energy future. 100% clean energy targets can vary by region, but should be time-bound, measurable, developed in partnership with community leaders, and include a commitment to address affordability, equity and access for all members of the community.

To date, cities have adopted this goal through a variety of commitments; following a Mayoral Commitment, San Francisco, CA integrated a goal of 100% RE into their climate action plan; Pueblo, CO and Moab, UT adopted city council resolutions; and in Burlington, where the community is served by a municipal utility, the city integrated the goal into the utility's integrated resource plan.

The outcomes of the 100% commitment greatly depend on who within your community signs on to it. A mayoral commitment is a strong first step, but the mandate to implement it is strengthened by a binding commitment and clear assignment of responsibilities for implementation. It will also be critical to engage in negotiations with the company(s) that currently provide electricity, transportation, and heating services for your community as soon as possible.

A commitment to 100% renewable energy should include the following core elements:
- **All Electricity:** A full transition of the electricity sector to clean, renewable energy;
- **By 2035:** A target year for when this commitment will be achieved no later than 2035 for electricity and 2050 for all energy sectors;
- **Ensuring Equity, Affordability, and Access:** A commitment to achieving equity, affordability, and access for all members of the community in the transition to 100% renewable energy;
- **Clean and Renewable Resources Only:** A clear definition of clean and renewable resources; and
- **A Transparent and Inclusive Process:** A commitment to a transparent and inclusive process for planning and implementation, ensuring that the public has an opportunity to participate.

We suggest the commitment also include:
1. **All Energy Sectors:** A commitment to transition other energy sectors to 100% including transportation and heating and cooling;

2. **A Goal for Local Generation:** A goal for how much of the community's energy needs will be met by local, distributed generation;
3. **Timeline for Planning and Implementation:** At least the first year, ideally a five year plan;
4. **Commitment to Collaboration:** A commitment to work with surrounding communities in achieving aligned clean energy and equity goals;
5. **Commitment to Advocate:** A commitment to advocate for policies or regulations at the state, regional and/or federal level that aid the city in their transition

Action 2: Assess Opportunities

Cities have more authority over their community's energy resources than you may realize. Below we've summarized the pathways cities have pursued to-date to implement their 100% electricity commitments. Each city should do an individual assessment of the options currently available based on regional and state laws.

PLANNING AND ASSESSMENT - As a first step in your roadmap, we recommend that you assess your baseline energy, greenhouse gas emissions, and socioeconomic factors.

- **Energy:** Important indicators to track for energy include total annual electricity consumption, total greenhouse gas emissions, the utility's current electricity resource mix, percentage of rooftops with solar installed, and the average cost of electricity per ratepayer. There are a number of energy and GHG baseline planning tools including ICLEI, NREL, and Project Sunroof.
- **Equity:** Socioeconomic indicators that you can track include the number of local clean energy jobs created, money saved from the avoidance of energy imports, economic benefits to local businesses and industries, decrease in energy costs, especially for low- and moderate-income households, avoided pollution and related health costs, and ensuring that a minimum percentage of all investments in clean energy infrastructure benefits disadvantaged communities, with a minimum of projects located directly in those communities. The UC Berkeley Labor Center and the Energy Democracy Alliance both have detailed guidance on this topic.
- **Policy and Regulatory Landscape:** It is also critical to assess the local, state and federal policy landscape on energy - what are the current laws in place to enable the transition, what successful policies have other local or state governments implemented. The State Policy Opportunitiy Tracker and the Database for State Incentives for Renewable Energy are both excellent resources to determine what existing energy laws and regulations are in place in your state.

ELECTRICITY. The following are examples of how other cities that have committed to 100% have pursued their goal. In order to achieve 100%, it is likely that your community will pursue a mix of the options outlined, and may also help to develop investment and partnership models not yet in practice.

- **Direct Investment in local, distributed solar and wind:** There are a range of ways the city can meet its 100% goal through local, distributed wind or solar:
    - Power at least a portion of municipal operations with on-site generation
    - Adopt city policies that enable residents and small businesses to install on-site renewable projects and/or invest in community solar or wind projects
    - Incentivize commercial, industrial, and other large-energy consumers in utilizing roof and parking-lot space for on-site solar and wind through building codes, simple permit processes and/or local tax incentives.
    - Participate in cooperative buying pools with other municipalities or large energy customers to aggregate your buying power.

  Check out the US Department of Energy SolSmart Program for more information and examples of case studies of cities like Hartford, CT, Columbia, MO, and Milwaukee, WI, just a few of the cities that have been designated as gold leaders in making it faster, cheaper, and easier to go solar.

- **Power Purchase Agreements (PPA)** - PPAs offer an avenue for communities to build commercial or utility-scale renewable energy projects to power municipal operations, hospitals, public schools and other energy users by contracting directly with an independent electricity generator or system owner to finance and implement renewable energy installations. Benefits of PPAs include the delivery of predictable, lower cost energy, long-term pricing, renewable energy certificates and tax credits, without large upfront costs. See NREL and SEIA for more details on PPAs.

- **Work with your Current Utilit(ies):** Most electric utilities in the U.S have invested in some level of renewable energy, and many are mandated by state renewable portfolio standard to transition a large percentage of their energy portfolio to renewable resources. Community-wide, you will likely represent a significant percentage of their total customers and load, and therefore have leverage to push the utility to pursue more ambitious renewable energy investment plans. Opportunities where cities can pursue the conversation on 100% include the utility's integrated resource planning process, and via the franchise agreement in place in most communities granting the utility right-of-way for transmission and distribution infrastructure. Shortly following Salt Lake City's commitment to 100% Renewable Energy, the city announced a new agreement with their utility, Rocky Mountain Power, in which the utility committed to working with the city to achieve their energy goals.

- **Existing Cooperative and Municipal Utilities:** Many of the communities that have successfully transitioned to renewable electricity - including Burlington, VT, Aspen, CO and Georgetown, TX - are served by a municipal or cooperative electric utility that own the power generation sources or engage in Power Purchase Agreements for their electricity customers. In places where a local community is already served by a municipal or cooperative utility, the local government can direct the utility to increase their use of renewable energy sources and implement programs that incentivize

residential and commercial action on energy efficiency, rooftop solar, and electric vehicle infrastructure.

- **Community Choice Aggregation (CCA)** - Community Choice Aggregation allows local governments to pool (or aggregate) their electricity load in order to purchase and/or develop power on behalf of their residents, businesses, and municipal accounts. CCA is an energy supply model that works in partnership with the region's existing utility, which continues to deliver power, maintain the grid, provide consolidated billing and other customer services. Historically, local governments have pursued CCA's in order to secure lower electricity rates for their residents. Recently in California CCA programs have launched that offer both lower rates and a cleaner electricity mix than what is offered by the existing utility.[2] CCA's are currently legal in CA, NJ, IL, MA, OH, RI, NY and under consideration in MN and UT. For more detail check out the Local Energy Aggregation Network.

- **Municipalization:** Municipalization is when a city or county takes control of its electric or gas system from an Investor Owned Utility (IOU) or Rural Electric Cooperative (Co-op). In addition to enabling a community to sources its energy needs from renewable energy, forming a municipal utility can lower rates, improve reliability, and create more community control over how the utility is operated. In recent years, Boulder, CO, Thurston County, WA, and Daytona Beach, FL have all pursued municipalization. For more detail check out the Community Power Network.

[Side Box] A Note on Unbundled Renewable Energy Credits (RECs). We do not recommend this as an investment primarily because RECs do not provide a potential for energy-costs savings, local job creation nor a guarantee of new renewable energy online. However, if a city does purchase RECs to offset the current electricity mix, you should ensure that the RECs meet the EPA's guidance on purchasing RECs and are sourced from facilities within your local renewable certificate tracking system. Over time, we advise the city to phase down the purchase of RECs and replace with direct investments in renewable energy projects as quickly as possible.

TRANSPORTATION
For the transportation sector, we recommend that the community pursue the following actions:

- Establish policies that reduce vehicle miles traveled by shifting passengers and freight to more efficient modes of travel, including transit, walking and biking, and creating an integrated transportation system.
- Establish policies that build infrastructure for electric cars, buses, and trucks.

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[2] http://www.ebce.org/app_pages/view/41

- Establish vehicle fleet mandates that eventually require 100% of municipal vehicles (cars, garbage trucks, etc.) and transit vehicles (buses and non-revenue fleet cars) are electric, with interim targets created.
- Promote a widespread switch among the public to electric vehicles through programs such as educational outreach, excise tax waivers, rebates, EV car-sharing programs, etc.
- Ensure broad stakeholder engagement on green transportation, including among city and state agencies, utilities, various community, environmental, and health NGOs, impacted industry groups, and the public at-large.
- Prioritize smart land-use planning, public transportation and clean, alternative modes of travel in local transportation budgets
- Reallocate funds to support integrated multi-modal public transportation infrastructure and clean modes of transportation (high capacity vehicles, rail, light rail and subway systems, walking, biking, and bus, as appropriate), as well as judiciously prioritized road and infrastructure repair.

Action 3: Build a Policy Framework

A roadmap can help your community to define concrete, funded activities with assigned accountability for research, development and implementation. It is critical to underpin the city's transition roadmap with plausible policy measures that integrate this commitment with existing to fiscal, energy, economic and infrastructure policies. Below are some examples of of city climate and energy plans that include roadmaps to achieving 100% renewable energy:
- San Francisco, CA: Renewable Energy Task Force Recommendations Report
- Greensburg, Kansas: Sustainable Comprehensive Master Plan
- Burlington, VT: Climate Action Plan
- San Diego, CA: Climate Action Plan

ICLEI's 100% Renewable Energy Cities & Regions Network provides guidance, tools and a network of experts that can aide you in developing a plan to transition your community.

Action 4: Demonstrate Immediate Progress

Build, support or incentivize clean energy projects that benefit low-income residents and/or communities impacted by fossil fuels. Public buildings can also serve as locations for clean energy projects. Its critical that these projects are built at-scale, and not just small demonstration projects that generate a small portion of the building's energy needs.

Action 5: Invest in Learning and Cooperate with Surrounding Areas

The path to 100% is still being built. We do not have all the answers to how we will accomplish this transition today. In fact, a number of the solutions that will enable this transition have yet to be developed or refined. Further each community's unique geography, history, demographics, and socio-economic characteristics will shape and influence the solutions each city pursues.

Cooperation among cities, towns, and rural areas can provide advantages and efficiencies for all parties since most cities cannot meet this transition within their city boundaries, and rural communities. Over 2500 cities from across the globe are also sharing their progress and lessons learned through the UNFCCC's Global Climate Action tracker.

Action 6: Track and Assess Progress

Track and assess your progress towards 100% and evaluate ways to improve, refine and build upon the initial projects pursued. There are a number of well respected tracking tools for cities that are implementing climate and energy solutions including Star Communities, ICLEI's HeatPlus, and CDP.

Action 7: Advocate

A transition that achieves all of the principles and guidelines outlined in this document will require each community to become strong advocates for policies at the state and federal level that encourage rapid deployment of renewable energy. It will also be critical to engage in ongoing dialogue and negotiations with the companies that currently provide electricity, transportation, and heating services for your community.

Appendix 1: Summary of City Commitments (As of November 30, 2016)

City	State	Population	Transition Year	Resource Mix	How
100% Clean Energy Communities					
Aspen	CO	6,600	2015	46% small hydro, 54% wind, 1% landfill gas	City Commitment achieved through Direct ownership and PPAs
Burlington	VT	42,282	2015	77% Class II RECs, 23% Hydro, 0.3% Solar	Municipal Utility Integrated Resource Plan achieved through direct ownership PPAs and RECs
Columbia	MD	133,358	2015	75% wind, 25% solar	RECs
Greensburg	KS	14,660	2013	wind, solar, geothermal	local solar and geothermal + PPA for 12.5 MW of wind
Kodiak Island	AK	14,135	2012	Wind and Hydro	Kodak Electric Association adopted goal and built wind
Rock Port	MO	1300	2008	100% Wind	PPA
Communities Committed to 100%					

City	State	Population	Target Year	Notes	Mechanism
Boulder	CO	103,166	2030		Mayoral Commitment
Del Mar	CA	4,400	2035		Council Resolution
East Hampton	NY	21,457	2030		Council Resolution
Georgetown	TX	54,256	2017		Utility Integrated Resource Plan, implemented through Wind and Solar PPAs
Grand Rapids	MI	192,294	2020		
Nassau	NY	4,789	2020		Proclamation
Palo Alto	CA	63,000	2017		Climate Action Plan
Park City	UT	7962	2032		Council Vote and Mayoral Pledge
Rochester	MN	110,742	2031		Mayor Proclamation
Salt Lake City	UT	191,180	2032		City Council Approved Climate Plan
San Diego	CA	1,300,000	2035		Climate Action Plan
San Francisco	CA	805,235	2020	pursuing primarily through CCA program	Mayoral Commitment and Climate Action Plan
San Jose	CA	960,000	2022		"Green Vision"
Taos	NM	5731	2030		Joint Resolution
St Petersburg	FL	249,688	2030		Council Resoution

THE FUTURIST

Predictions and a few fantasies about 2018

David Houle

Welcome to 2018! I like the serendipity of having a column with the title "The Futurist" run on the first day of the year. This allows me to provide you with forecasts for 2018.

This column is divided into three parts. First, the long-term, macro trends that will continue to affect us in 2018. This is my stock-in-trade: being highly accurate over a five-year time-frame and directionally accurate for 10 years out with macro trends. Second, some forecasts about 2018. These may be more variable in accuracy as they are close-in and specific. Third, my personal fantasy wish list of things I'd like to see happen this year.

Long-term trends that will continue to be manifested in 2018

• AI/machine learning. While this technology has been around for decades, in the last three years it has finally begun to realize its almost unimaginable possibilities. Not since electricity has there been a technology as transformative of the way we live and work. This trend will accelerate this year.

There will be more technology and services in our lives that provide value because of artificial intelligence. There will be new gadgets, and updates on current ones, such as Alexa and voice search. The debate about AI/machine learning will continue but the technology will continue to develop, so our discussions will move from whether it's good or bad to how to ensure that its outcome will be good.

• Autonomous automobiles. The age of autonomous automobiles begins this year. We will see the sales of driverless cars to communities and then to individuals. Twenty-one states, including Florida, have passed legislation regarding these vehicles. Arizona is leading all states with a ride-sharing test in 2017 using only autonomous automobiles. This is a real case of the future rushing at us.

• The reality of climate change. In July of 2013, I forecast that, starting in 2014, the awareness of climate change would increase and a significant majority of Americans would realize that this huge, existential threat is real. In early 2017, a Yale study showed that 72 percent of all Americans — and the same percentage in our congressional district — accept that climate change is real and due in part to human activity. Only 6 percent believed that "climate change is a hoax."

In 2017, Congressman Vern Buchanan, R-Fla. — as I noted in an earlier column here — came out in favor of the U.S. remaining in the Paris Climate Accord that President Trump later pulled the U.S. from. Hundreds of billions of dollars were lost due to climate change-amplified severe weather and fires in 2017. Unfortunately, 2018 will see more of the same.

• Blockchain technology. This will continue to increase in long-term importance. This technology could start disintermediation in the financial sector. The cryptocurrency bitcoin is the first application out of the gate of blockchain technology and will continue to be a volatile investment, despite the usefulness of blockchain. I think virtual currencies will continue to be a big story and this will be the year when they start to move from the speculative wild west to a more accepted alternative investment class and form of payment.

Short-term forecasts

• U.S. Politics. Well, this is the big one, in terms of our collective attention. If the Democrats can develop aggressive messaging and If they develop good messaging candidates, then this year