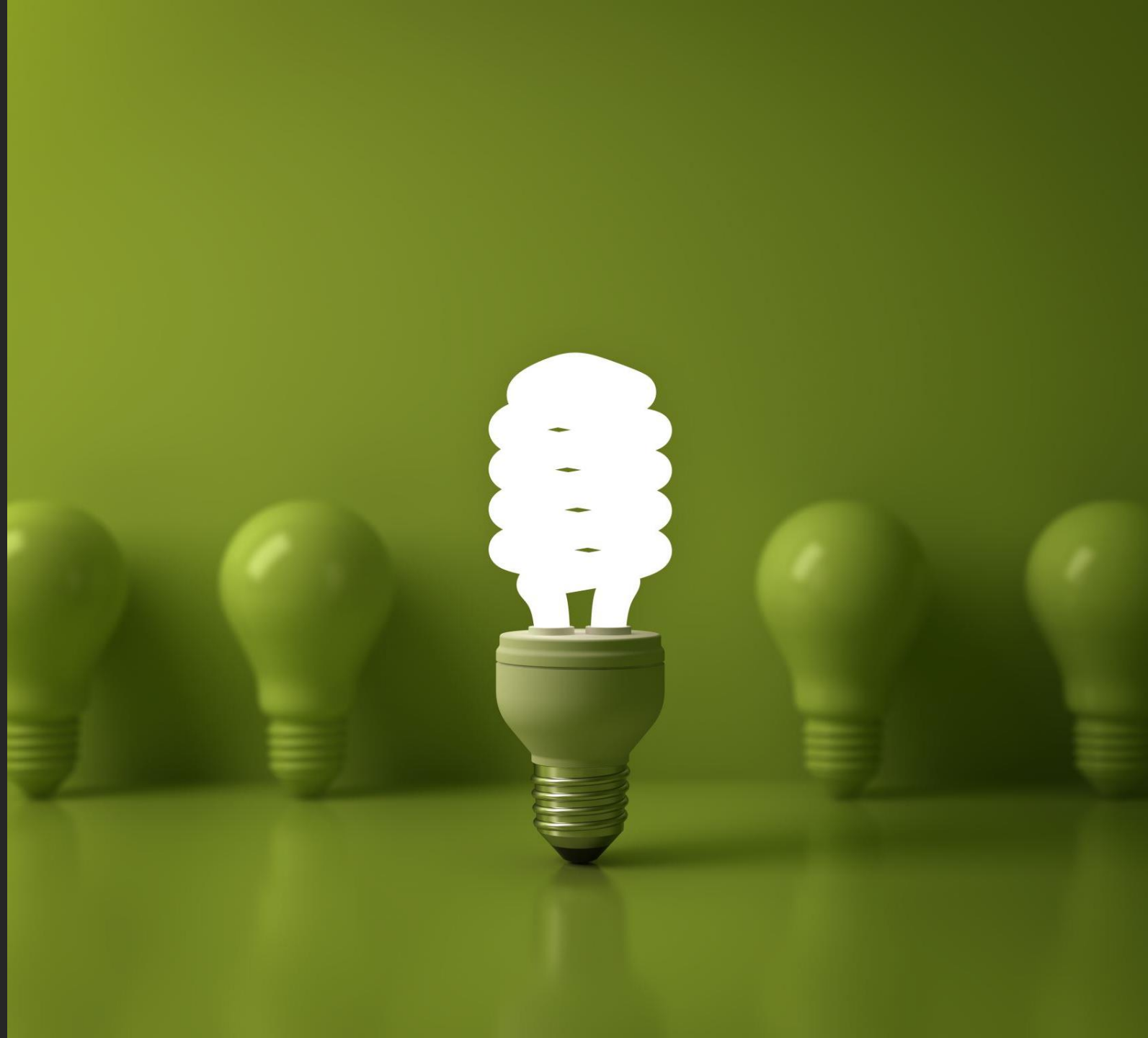

MOBLIZING THE WORKFORCE FOR THE BIG GREEN SHIFT

NOVEMBER 19, 2020

JANINE FINNELL

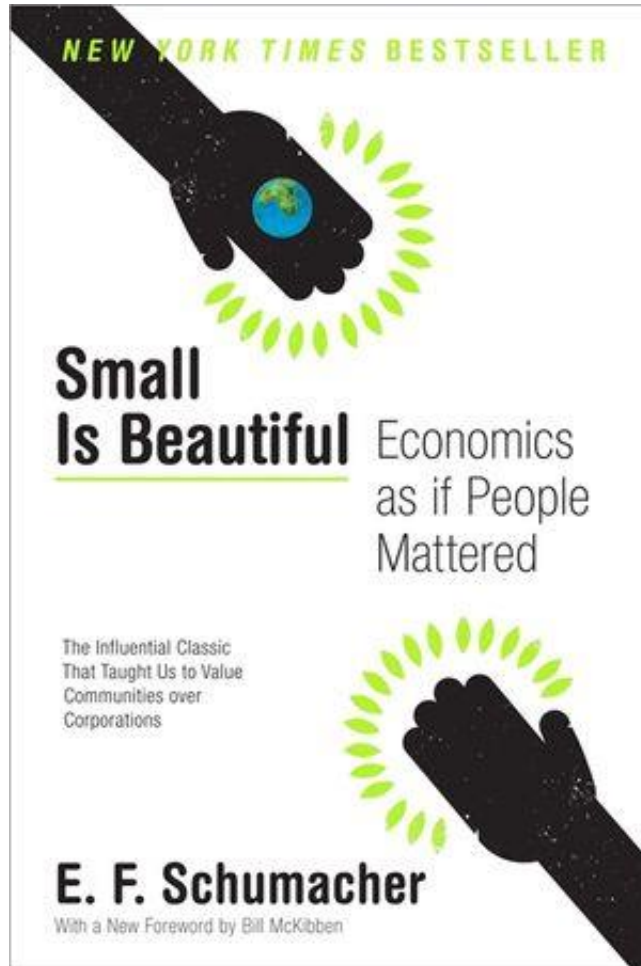
EXECUTIVE DIRECTOR, LEADERS
IN ENERGY



Outline

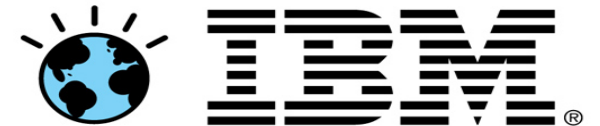
- Part 1: My Green Career Path
- Part 2: Enabling “The Big Green Shift”
- Part 3: The COVID-19 Pandemic and Shifting Marketplace
 - Pivoting
 - Resetting/Rethinking
 - Trend-Spotting
- Part 4: Six Green Career Navigational Tips

Part 1: My Green Career Path



“Concept of Appropriate Technology”
Masters thesis on methane digesters in India to provide biogas and fertilizer

My Green Career Journey



TECHNOLOGY & MANAGEMENT SERVICES, INC.





Sustainable Communities



Green Economy and Jobs



**Multigenerational Leadership
and Talent**



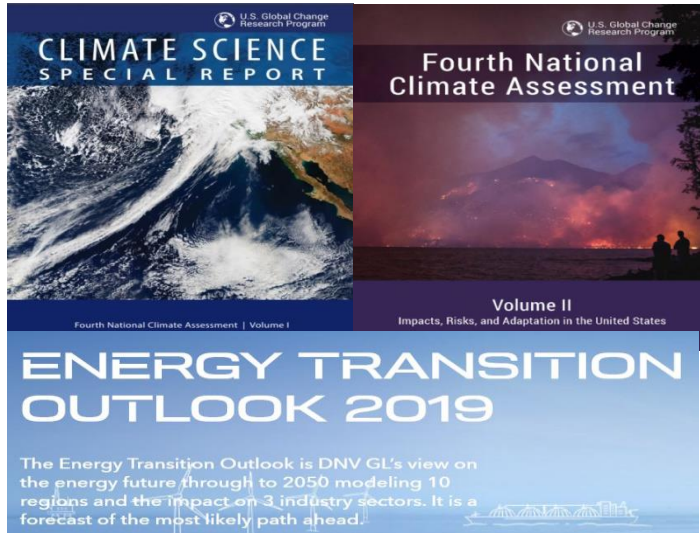
Leaders in Energy

Building a community of leaders to advance clean energy and sustainable solutions

*Join us on-line and at our events on cleantech, green jobs and finance,
and leadership at:*

leadersinenergy.org

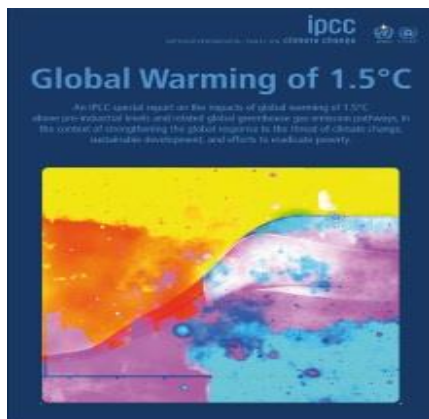
Part 2: Creating a More Sustainable World & Positive Future – “The Green Big Shift”

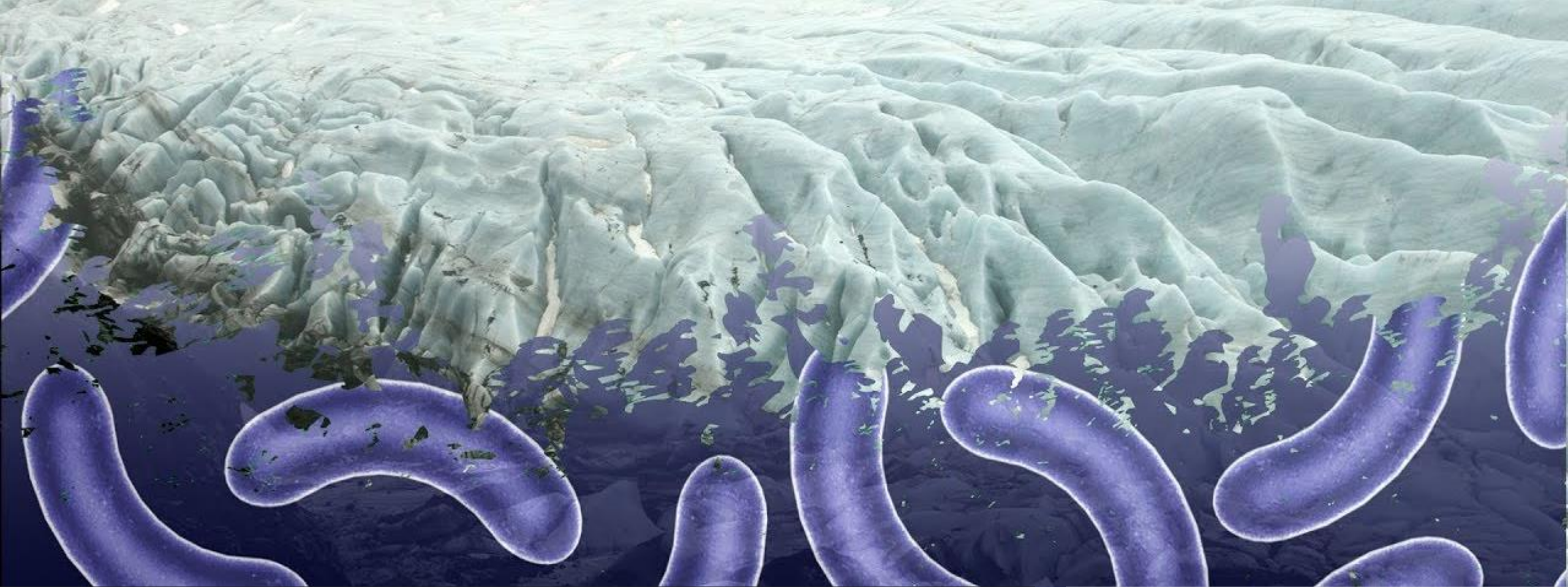


LE & Others Working to Build that Bridge



<https://www.youtube.com/watch?v=p-rTQ443akE>





Why we should act now to help the planet and to keep the temperature from rising globally?

<https://www.youtube.com/watch?v=tSA5HNFBwnk>

Leaders in Energy Conducts Green Jobs Forums and Workshops

7TH ANNUAL
GREEN JOBS FORUM

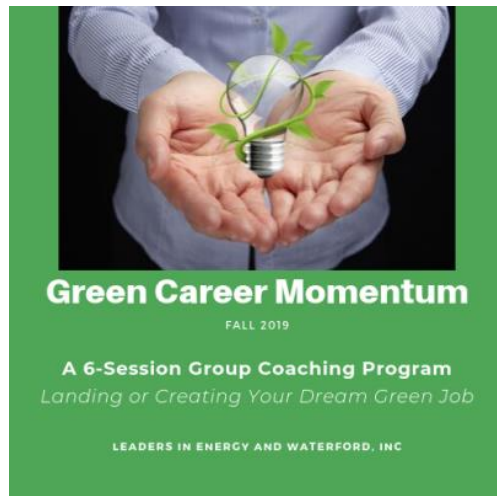


Leaders in Energy

**Jobs for a Just,
Equitable, and
Green Future**

Thursday, August 27, 2020
6:00 - 9:00 pm EDT (Held virtually)

Register at: leadersinenergy.org



Green Career Momentum

FALL 2019

A 6-Session Group Coaching Program
Landing or Creating Your Dream Green Job

LEADERS IN ENERGY AND WATERFORD, INC



Green Career Workshop 1.0: What's Your Green Career Plan?
Green Career Workshop 2.0: What's the Best "Fit" for Your Career Path?"

What are Green Jobs?

International Labour Organization Definition

Green Economy Map

Industries and Sectors within the Green Economy



Source: Carol McClellan, Green Career Central (website no longer functional)

- Green jobs are decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency.

Green jobs help:

- Improve energy and raw materials efficiency
- Limit greenhouse gas emissions
- Minimize waste and pollution
- Protect and restore ecosystems
- Support adaptation to the effects of climate change

Source: https://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang--en/index.htm

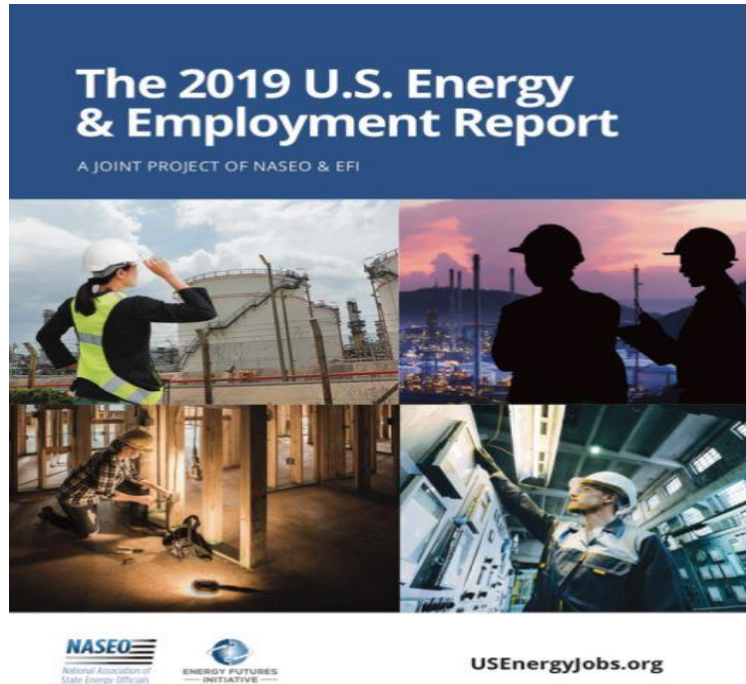
Doing Well While Doing Good is On the Rise



- Cleantech and sustainability jobs are among the fastest-growing segments of the economy!
- [Now Hiring: The Growth of America's Clean Energy & Sustainability Jobs](#) - EDF and Meister Consultants Group estimates that sustainability collectively represents 4-4.5 million jobs in the U.S.
- Report highlights 4 areas of employment in:
 - Renewable energy
 - Energy storage and advanced grid
 - Energy efficiency
 - Advanced vehicles and transportation

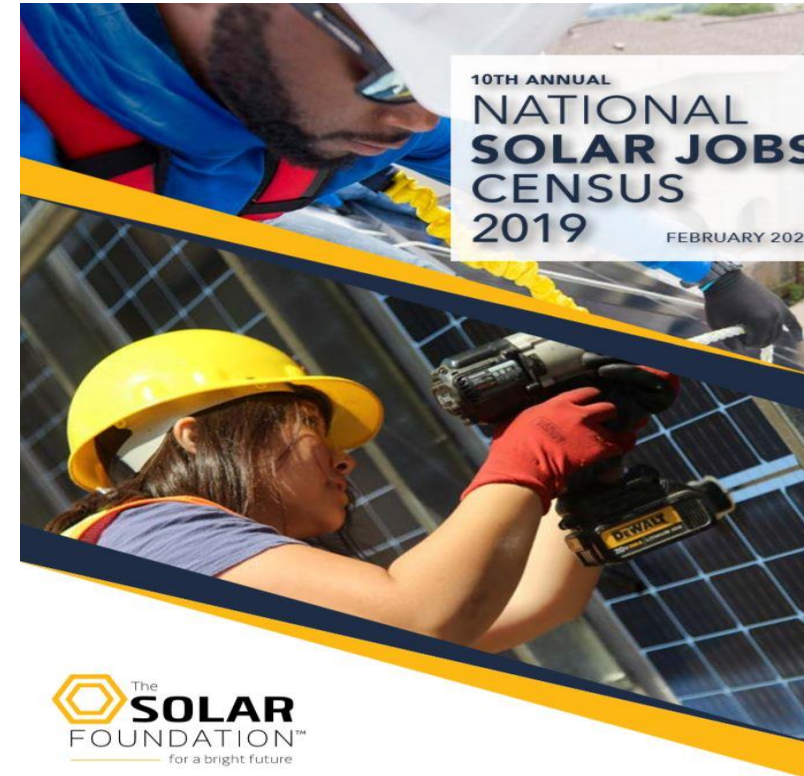
Download report here: <https://www.edf.org/energy/clean-energy-jobs>

2019 U.S. Energy & Employment Report



- States' energy economy is “not only growing, but evolving and thriving.”
- Nationally, in 2018 the energy economy expanded by more than 150,000 net new jobs to encompass 6.7 million people, representing nearly 5 percent of the U.S. economy.
- **Energy Efficiency** employed 2.35 million Americans, in whole or in part, in the design, installation, and manufacture of Energy Efficiency products and services, added 76,000 net jobs in 2018, an increase over the 67,000 jobs added in 2017.
- **Motor Vehicles** (including component parts) employed over 2.53 million workers (excluding automobile dealerships and retailers) added 74,000 jobs in 2018, an increase of 3 percent from 2017.
- In 2018, almost 254,000 employees worked with **alternative fuels vehicles, including natural gas, hybrids, plug-in hybrids, all-electric, and fuel cell/hydrogen vehicles**, an increase of nearly 34,000 jobs.

National Solar Jobs Census – February 2020



TOP 10 STATES WITH SOLAR JOBS GROWTH

STATE	2018 Jobs	2019 Jobs	% Increase in Jobs 2018-2019	Jobs Added 2018-2019
Florida	10,358	12,202	17.8%	1,843
Georgia	3,696	4,798	29.8%	1,102
Utah	6,045	7,107	17.6%	1,062
New York	9,729	10,740	10.4%	1,011
Texas	9,612	10,261	6.7%	649
Illinois	4,879	5,513	13.0%	634
Virginia	3,890	4,489	15.4%	599
Indiana	3,114	3,600	15.6%	486
Louisiana	2,950	3,352	13.6%	402
Hawaii	2,120	2,484	17.2%	364

Source: <https://www.thesolarfoundation.org/solar-jobs-up-nationwide-and-in-31-states-after-two-years-of-losses/>

Part 3: The New COVID-19 Marketplace

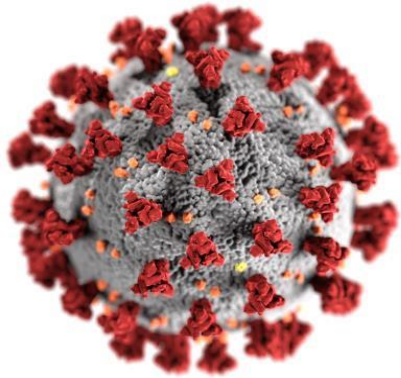
- Loss of 100,000 clean energy jobs in March 2020
- Further, nearly 400,000 industry workers suffer some form of job loss, when temporary unemployment and underemployment are considered. The majority of advanced energy businesses — about 60% — have not received any federal relief so far.

Source: “What’s the Ideal Way for the Microgrid Industry to Come Back from COVID-19?”, by Lisa Cohn, Microgrid Knowledge,” <https://microgridknowledge.com/microgrid-growth-covid-19/>



Photo from: *Why 30 Million Solar Rooftops Should Be In the Next Relief Bill*, by John Farrell, Institute for Local Self-Reliance, April 2020

The Coronavirus Pandemic -- A Silver Lining? Shifting Behavior for a Sustainable World?



Good News: Actions on coronavirus shows how society can implement broader behavior change. Climate emissions and other air pollutants have been decreasing due to lockdowns and travel bans.

Green Recovery/Stimulus?

- Europe is exploring reviving the global economy in the wake of the coronavirus pandemic via a 'green recovery' that helps the world tackle climate change.
- Speaking ahead of an upcoming virtual meeting of officials from some 30 countries, Germany's environment minister said it was important for economic recovery programs **to invest in future-proof jobs** that would help reduce greenhouse gas emissions in coming years, **rather than aim for a return to business as usual.**



Source: https://www.washingtonpost.com/world/europe/germany-britain-call-for-green-recovery-from-pandemic/2020/04/27/05adb276-8882-11ea-80df-d24b35a568ae_story.html



Opportunities for Green Jobs and Careers

- Pivoting
- Resetting/New Thinking & Mindset
- Trend Spotting

Pivoting - Assess Yourself

- YOU:
- Take a minute to take stock of what you've accomplished and have been dealing with during this crisis
 - Learning new behaviors, physical greetings have changed, social interaction, decontamination techniques
 - Practicing your patience: long lines, food and toiletry shortages, etc.
 - Schools closing and moving to online teaching
 - Possibly supporting that online teaching with kids at home
 - Delivery delays

Source: Candice Guillaudeu, COVID-19 and Pivoting while continuing to drive environmental sustainability, April 3, 2020, Your Business Our World, Link to PPT: <https://tinyurl.com/wlcxktc>

Opportunities – Sample COVID-19 Pivot Points

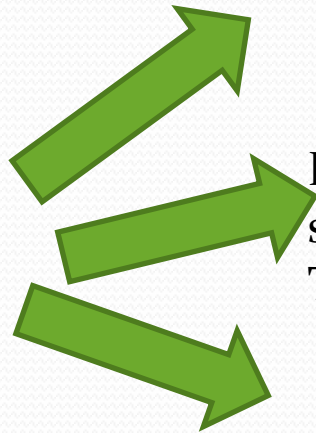
- Restaurants: Going to delivery and take-out only
- Salons: Virtual styling tips
- Clothing manufacturers switching to making masks and gowns -> strengths? -> having fabric
- Whisky distilleries making hand sanitizer – strengths? -> alcohol
- Dog Walkers delivering food
- GM making ventilators

Source: Candice Guillaudeu, COVID-19 and Pivoting while continuing to drive environmental sustainability, April 3, 2020, Your Business Our World, Link to PPT: <https://tinyurl.com/wlcxktc>



Career Trajectory/Pivot Example

Business/Economic/
Finance/Accounting
Backgrounds



Sustainable Investing – Companies: Morgan Stanley, Calvert Investment, Pax

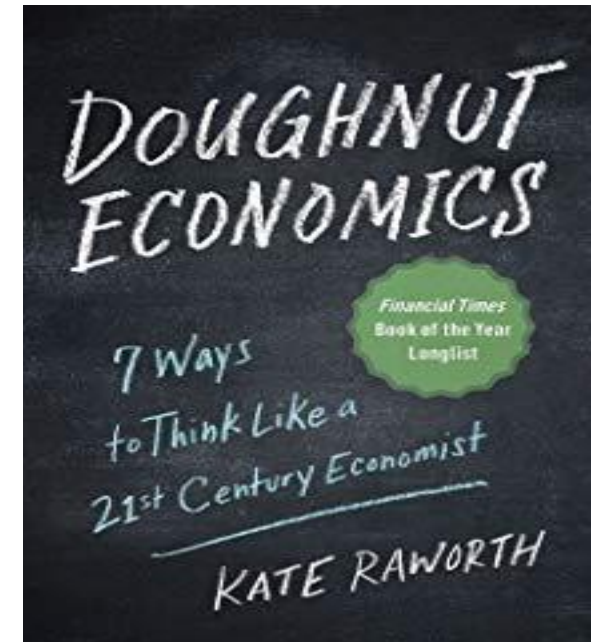
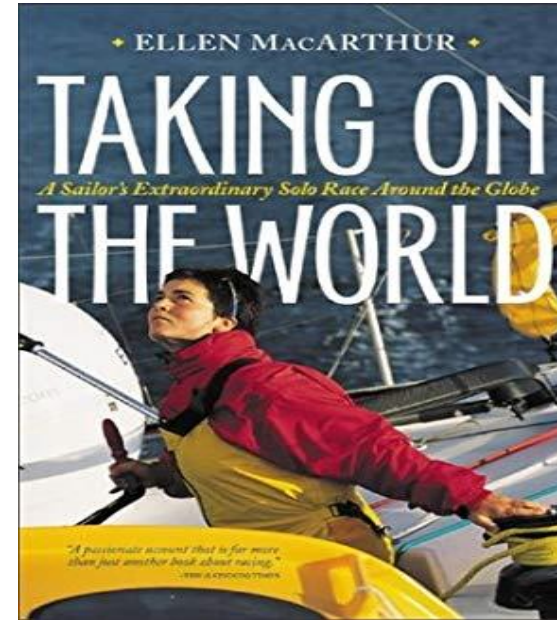
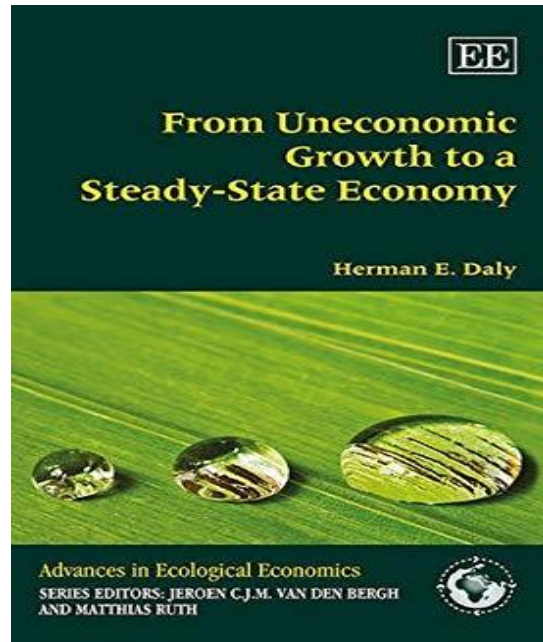
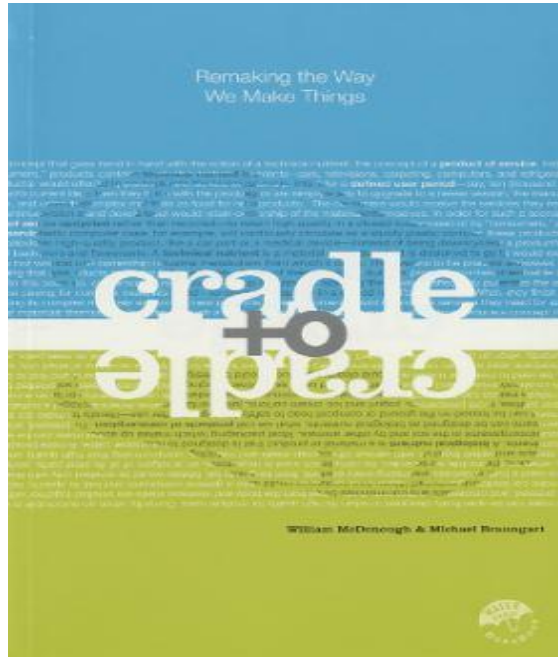
Data analysis and reporting pertaining to sustainability/energy efficiency, some businesses starting to include carbon footprint data in products, e.g. RE Tech Advisors, IBM, others

Risk mitigation pertaining to climate change and resiliency, e.g., examples of speakers and companies from a recent open source climate change webinar:

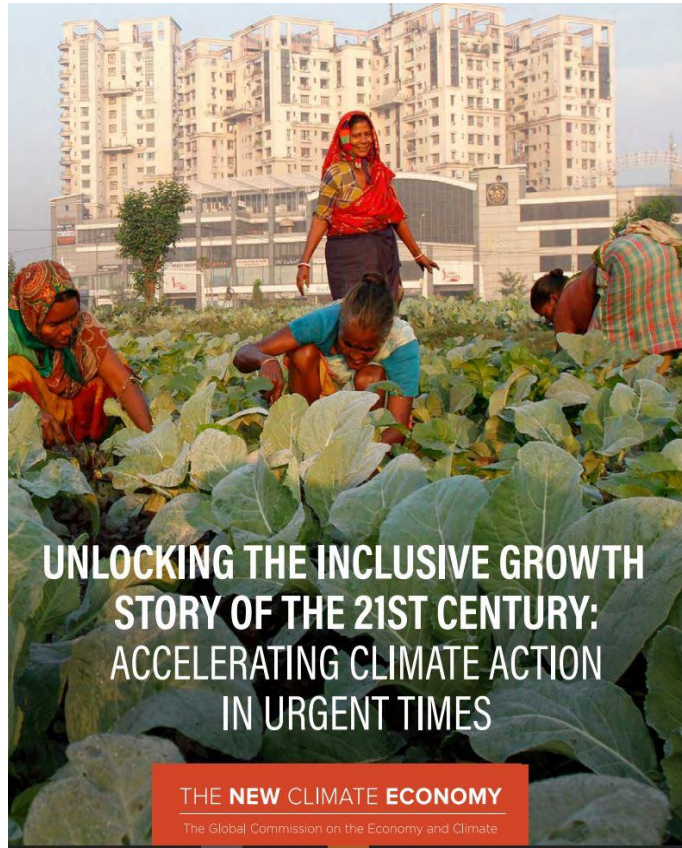
They will be joined by:

- Michael Tiemann, VP of Open Source Affairs at Red Hat/ IBM
- Josh Green, Founder of S&P Global Panjiva
- Ekaterina Gratcheva, Lead Financial Officer, Finance, Competitiveness and Innovation Global Practice at World Bank Group
- Julie Pullen, Director of Product for Jupiter Intelligence
- Ton van Welie and Lisa Eichler, CEO and Co-Head of Climate and ESG Solutions at Ortec Finance
- Ana Pinheiro Privette, Senior Program Manager with Amazon Sustainability
- Hewson Baltzell, President of Helios Exchange and Co-Founder of MSCI ESG Research

Resetting/New Thinking and Mindset Our 21st Century Economy and Systems



Potential for Creating A \$26 Trillion New Clean Tech/Climate Global Economy



- The Report highlights opportunities in five key economic systems – **energy, cities, food and land use, water, and industry (circular economy)**. It demonstrates that ambitious action across these systems could deliver net economic gains compared with business-as-usual by:
- Generating over 65 million new low-carbon jobs in 2030, equivalent to today's entire workforces of the UK and Egypt combined.
- **Yielding a potential direct economic gain of US\$26 trillion through to 2030.**

World Economic Forum Study – Creating a Nature-Positive Economy



- The World Economic Forum report alone identified 15 systemic transitions with annual business opportunities worth \$10 trillion that could create 395 million jobs by 2030.
- Together, these can pave the way towards a human- and nature-positive development which will be resilient to future shocks.



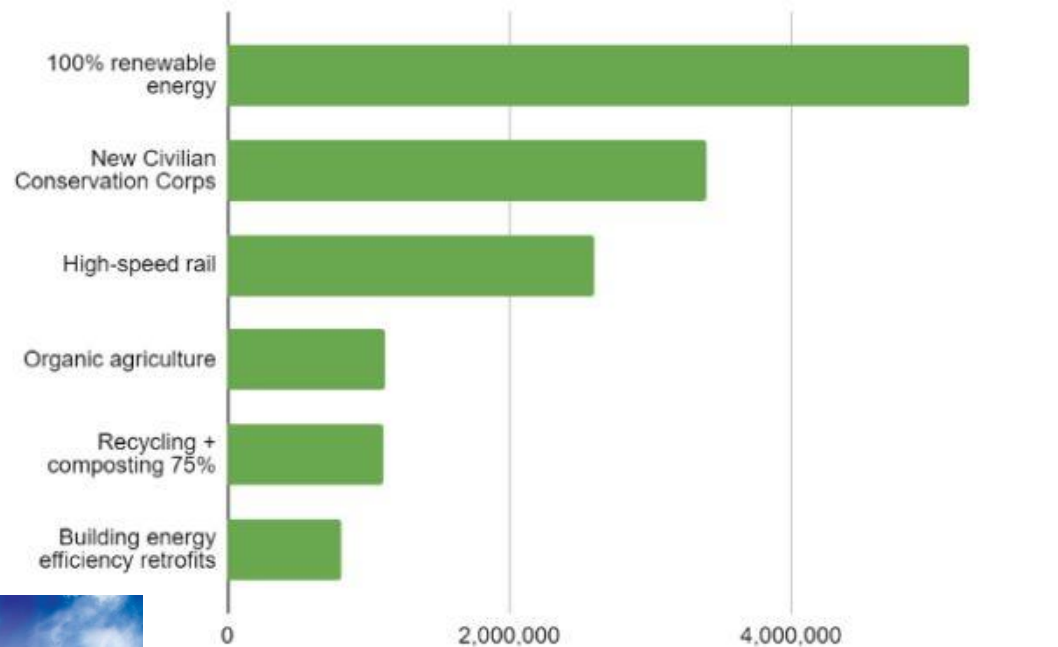
Trend-Spotting for Current & Future Opportunities

'Skate to where the **puck** is going, not to where it has been' A **quote** from the greatest **hockey player** of all time – Hockey Hall of Fame's Wayne Gretzky

- Move from Linear (take, make, waste) to Circular Economy (regenerative and operates akin to natural systems with no waste)
- Carbon management/Climate Change – New products to sequester carbon (Blue Planet), risk mitigation, resilience, regenerative ag, Association of Climate Change Officers, e.g. Certified Climate Change Professional
- Reducing food waste – Imperfect Foods, Last Call
- Smart ag – regenerative/climate controlled (indoor) - Jeffrey Landau, director of business development at [Agritecture Consulting](#) estimates the global value of the vertical farming market will rise to about \$6.4bn by 2023, from \$403m in 2013, with almost half that attributed to growth in the US.
- Sustainable investing and green finance (Morgan Stanley, Qualified Ventures)
- Green infrastructure – Smarter use of water resources
- New data platforms and analysis (virtual sea fences to protect wildlife, heard about on coastal resilience webinar)
- Need for greater local and regional supply chains for food security and resiliency.
- Post Covid-19 Policy Formulation:
 - What economic impacts should we anticipate from the COVID-19 crisis?
 - What implications do these impacts have for other policy priorities such as poverty reduction and equality?
 - What actions should governments consider to achieve balanced inclusive green growth through their COVID-19 responses?

Creating 14.3 Million New Deep Green Jobs

Drawing on analyses conducted by several groups, the following graph provides a breakdown of the 14.3 million green jobs that collaborative efforts between the public, private and non-profit sectors could create to help the US economy recover.



Breakout of 14.3 million new green jobs

100% renewable energy — Mark Jacobson’s **Solutions Project at Stanford University** calculates a potential for 5,258,782 new clean energy jobs.

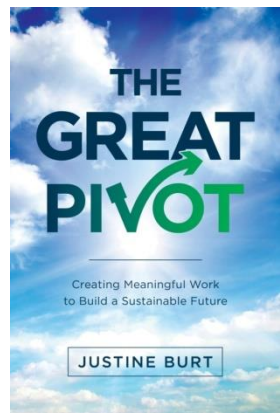
Collin O’Mara, the president of the National Wildlife Federation, proposes reviving the **Civilian Conservation Corps** to create 3.4 million jobs in reforestation, natural forest management, seagrass restoration, wetland restoration, dam removal, and endangered species recovery, among others.

High-speed rail — Massachusetts Representative Seth Moulton proposes a national high-speed rail network that would create 2.6 million jobs over 5 years.

Organic agriculture — Jon Rynn’s Green New Deal Plan from his book *Manufacturing Green Prosperity* estimates that the increased labor and new equipment required to farm all of our food organically would create an additional 1.12 million jobs.

75% recycling and composting — the **Natural Resources Defense Council** calculates that by expanding recycling and composting to handle 75% of our solid waste, we would create 1.1 million jobs.

Building energy efficiency retrofits — the **UCLA Luskin School** reported that upgrading California’s 14 million homes and 8 billion square feet of commercial space to zero net energy would create 80,600 building retrofit jobs. If we took the number of building retrofit jobs for California and multiplied to account for the US, it would mean the US would need 806,000 workers retrofitting buildings for zero net energy.



Source: “14.3 million new deep green jobs,”

<https://medium.com/@justineburt/14-3-million-new-deep-green-jobs-86448a2a66e5>

30 Green Jobs Pivot Areas

Energy

- (1) Zero Net Energy Retrofits – Single-Family Homes
- (2) Zero Net Energy Retrofits – Multi-Family Dwellings
- (3) Solar Emergency Microgrid Retrofits at Hospitals and Municipal Emergency Response Centers
- (4) Commercial Solar Siting Surveys for Counties
- (5) Zero Net Energy Retrofits – Commercial
- (6) Part-Time Embedded Sustainability Project Manager

Transportation

- (7) Development of Mass Transit
- (8) Transportation Management Association
- (9) Development of Safe Bicycling Infrastructure
- (10) Mobility-as-a-Service apps
- (11) Electric Vehicle Charging Infrastructure
- (12) Designing Walkable Communities

Circular Economy

- (13) Municipal Waste Prevention Coordinators
- (14) Building Deconstruction
- (15) Tool Lending Library + Repair Cafe + Maker Space
- (16) Upcycling Dead or Diseased Trees
- (17) Artistic Upcycling and Salvage
- (18) Recycled Content Product Manufacturers

Reduce Food Waste

- (19) Reverse Catering
- (20) Community Kitchens
- (21) Ugly Produce Distribution
- (22) Business Services Supporting Small, Organic Farms

Restore Nature

- (23) Carbon Farming
- (24) Restoring Healthy Forests
- (25) Construction Products and Furniture
- (26) Restoring Healthy Waterways
- (27) Wildlife Defense
- (28) Wildlife Restoration
- (29) Wildlife Overpasses and Underpasses
- (30) Rewilding for Habitat Restoration

- Business
- Non-profit
- Government

Source: Justine Burt Presentation
At Leaders in Energy, 7th Annual Green Jobs Forum,
August 28, 2020



President-Elect Joe Biden Proposed Initiatives Climate, Clean Energy, and Jobs



- **\$1.7 trillion climate plan over 10 years-** R&D for clean energy, tax credits to speed spread of renewable power and electric vehicles including boosting research and development into technologies including large-scale battery power storage and carbon capture and minimization.
- **Plan to create 10 million clean energy jobs**
- **Bring together America's top talent to innovate on climate.** America – with the leadership of government – has led the way on many technologies and innovations, from the GPS to computer networking. Biden will establish ARPA-C, a new, cross-agency Advanced Research Projects Agency focused on climate.

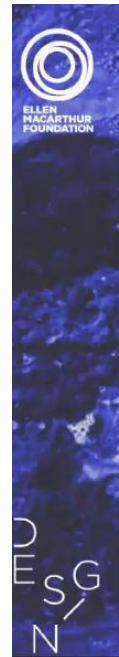
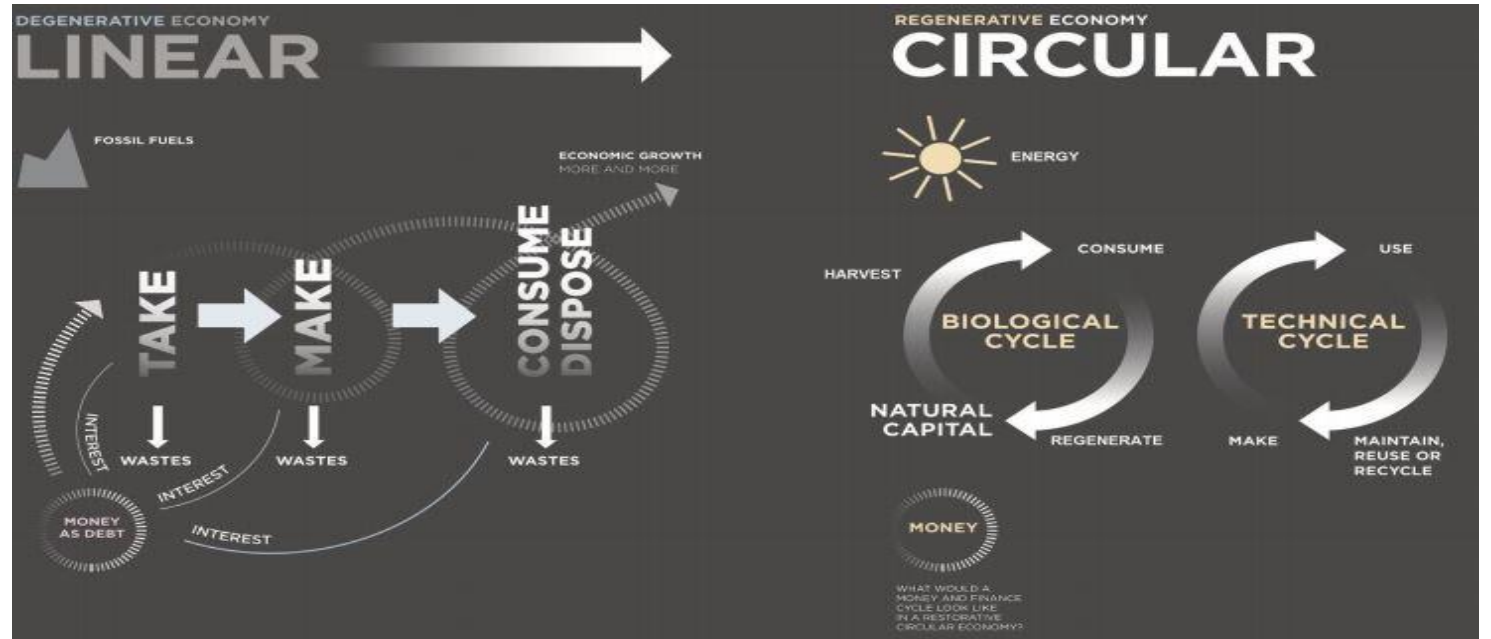
<https://joebiden.com/climate-labor-fact-sheet/>

Driving Environmental Sustainability – Do Any of These Areas Provide Pivot Points?



- **Based on Project Drawdown Solutions (drawdown.org) for Reducing Greenhouse Gases <sample solutions>**
 - Refrigeration management – phase out HFCs used in refrigerators and ac units
 - Wind turbines (on shore)
 - Reduced Food Waste
 - Tropical Forests – Restoring these forests also restores their function as carbon sinks
 - Educating Girls – Fits within UN Sustainability Goals
 - Silvopasture – Silvopasture is an ancient practice that integrates trees and pasture into a single system for raising livestock. ... This can sequester five to ten times as much carbon as those of the same size that are treeless, storing it in both biomass and soil.
 - Rooftop Solar

Source: Candice Guillaudeu, COVID-19 and Pivoting while continuing to drive environmental sustainability, April 3, 2020, Your Business Our World, Link to PPT: <https://tinyurl.com/wlcxktc>



Designing for the circular economy

Circular economy vision & principles



Design out waste and pollution



Keep products and materials in use



Regenerate natural systems



Design strategies

Safe & circular material choices

Dematerialisation

Product life extension

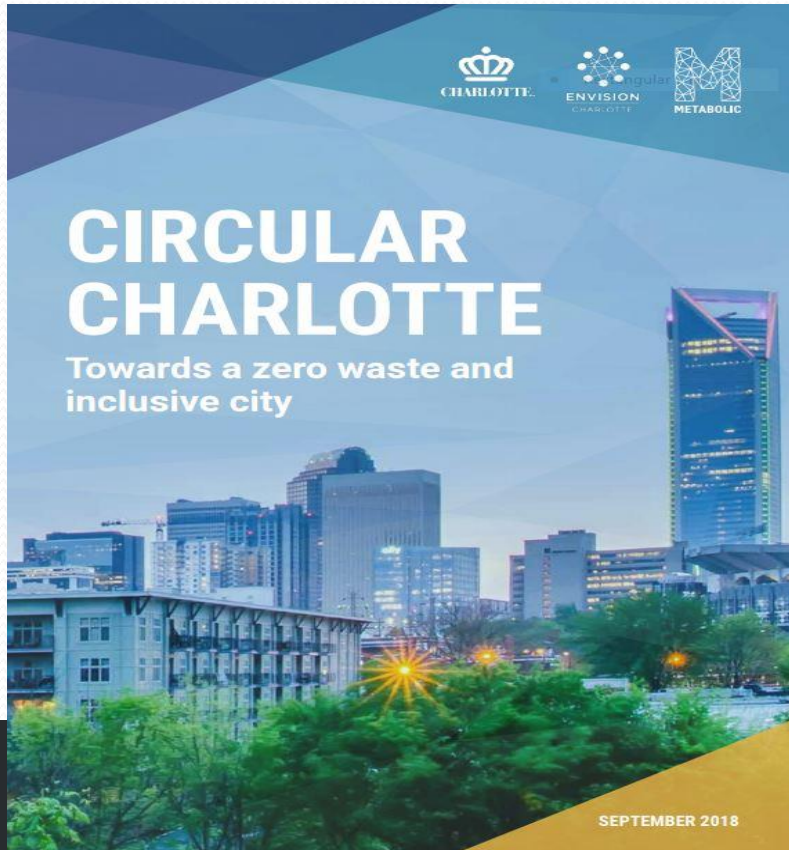
From products to services

Modularity

Designing for inner loops



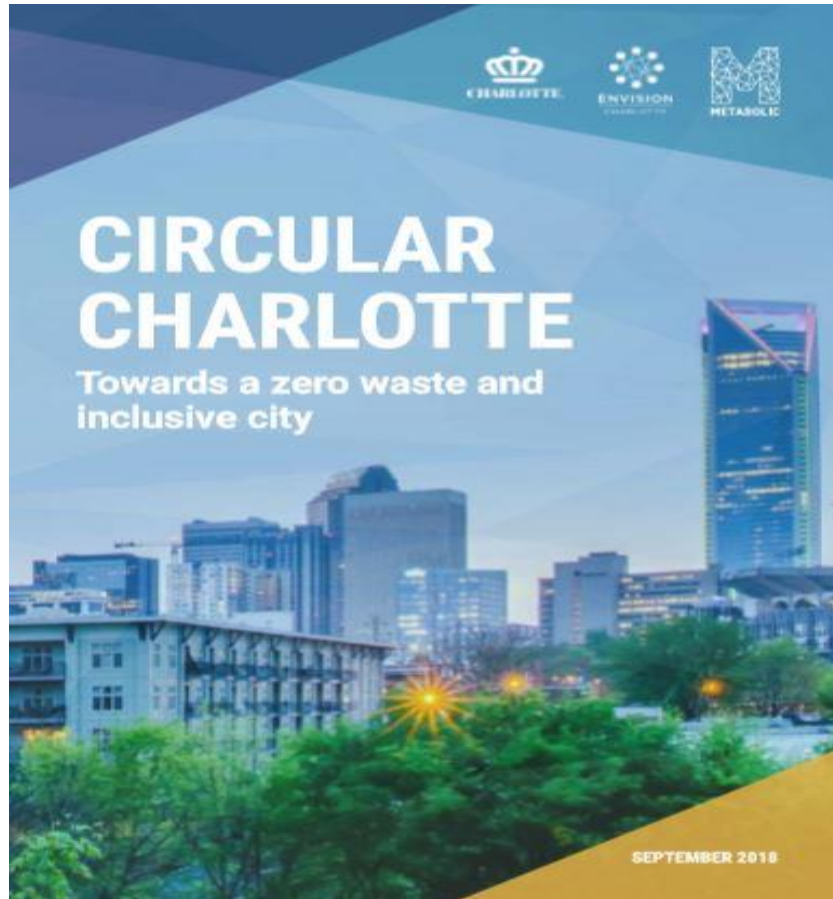
Examples of Circular Cities



Reimagine Phoenix
Transforming Trash Into Resources



Job Creation in Charlotte, NC



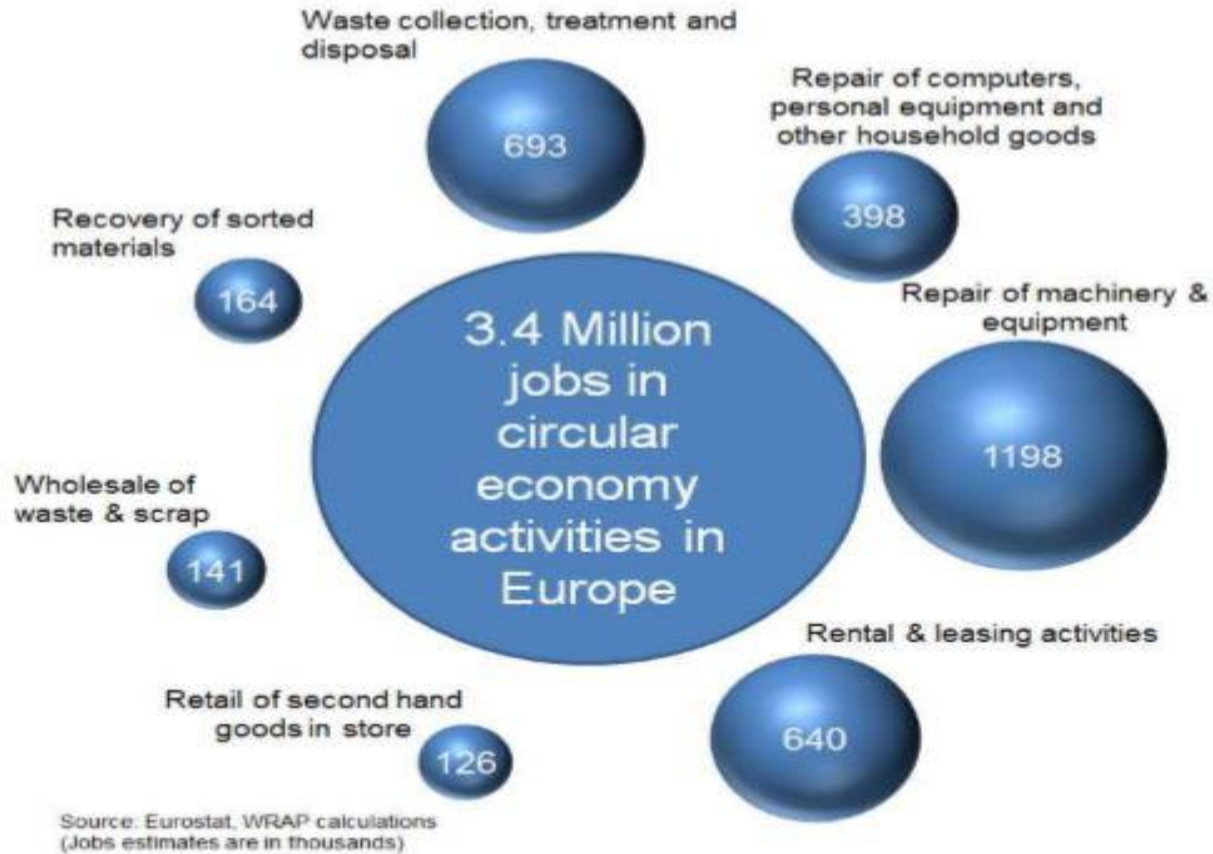
JOB CREATION POTENTIAL per 10,000 tonnes of used goods



Source: US EPA (2002) and the Institute for Local Self-Reliance



The Circular Economy and Job Creation



WRAP (the UK's Waste & Resources Action Plan) has published a study showing that expansion of the Circular Economy could create up to 3 million extra jobs in the European Union by 2030; three times more than the 'business as usual' scenario.

Source: <http://www.wastecosmart.eu/en/news/wrap-study-circular-economy-could-create-3-million-jobs-in-eu>

Examples of Sustainability Companies & Initiatives in Delaware



- White Dog Labs
- Delaware Sustainable Chemistry Alliance
- Energize Delaware
- Delaware Sea Grant
- Delaware Local Food Exchange
- Delaware Nature Society

• **Source:**
<https://lautrecouleur.com/top-sustainable-companies-in-delaware/>

Expand Your Green Network Via Leaders in Energy to Connect with Others in Green Careers and Pursuits!



- Connect with our on-line community at leadersinenergy.org
- Join our discussion group on LinkedIn
- Follow us on our Facebook and Twitter pages)
- Attend our events, working groups, and workshops; and volunteer for an event or serve on our Board and team.



Janine Finnell
Executive Director
Leaders in Energy

leadersinenergy.org
[@LeadersinEnergy](https://twitter.com/LeadersinEnergy)

Email: jfinnell@leadersinenergy.org

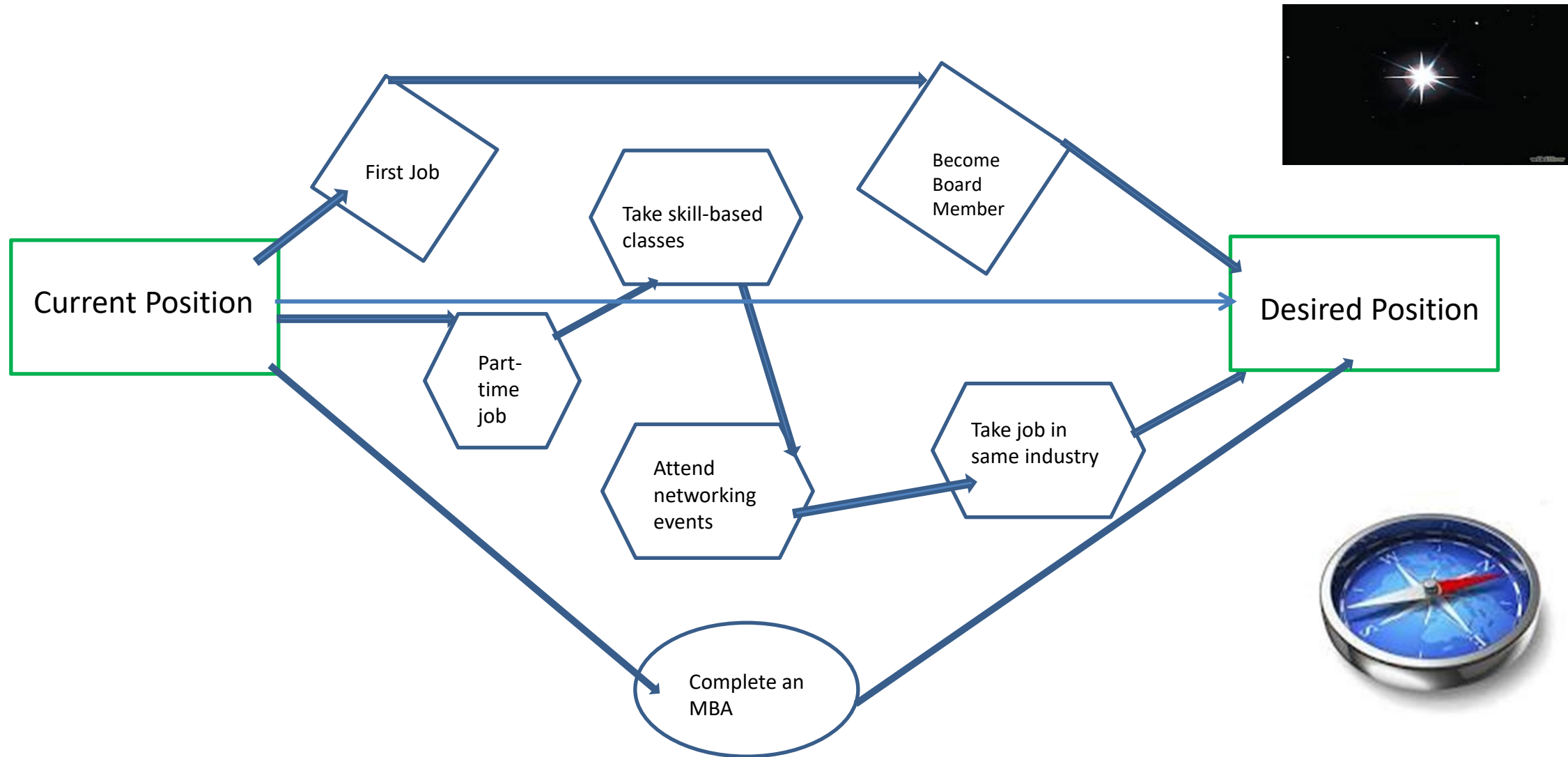
Phone: 703-203-0766



Part 4: Six Green Career Navigational Tips



Navigating Your Green Career Path In These Times



Source: Adapted from Path Diagram from "Sustainability Jobs: The Complete Guide to Landing Your Dream Green Job," by Kevin Wilhelm et al., 2016

Tip 1 - Follow the Money to Find Potential Jobs



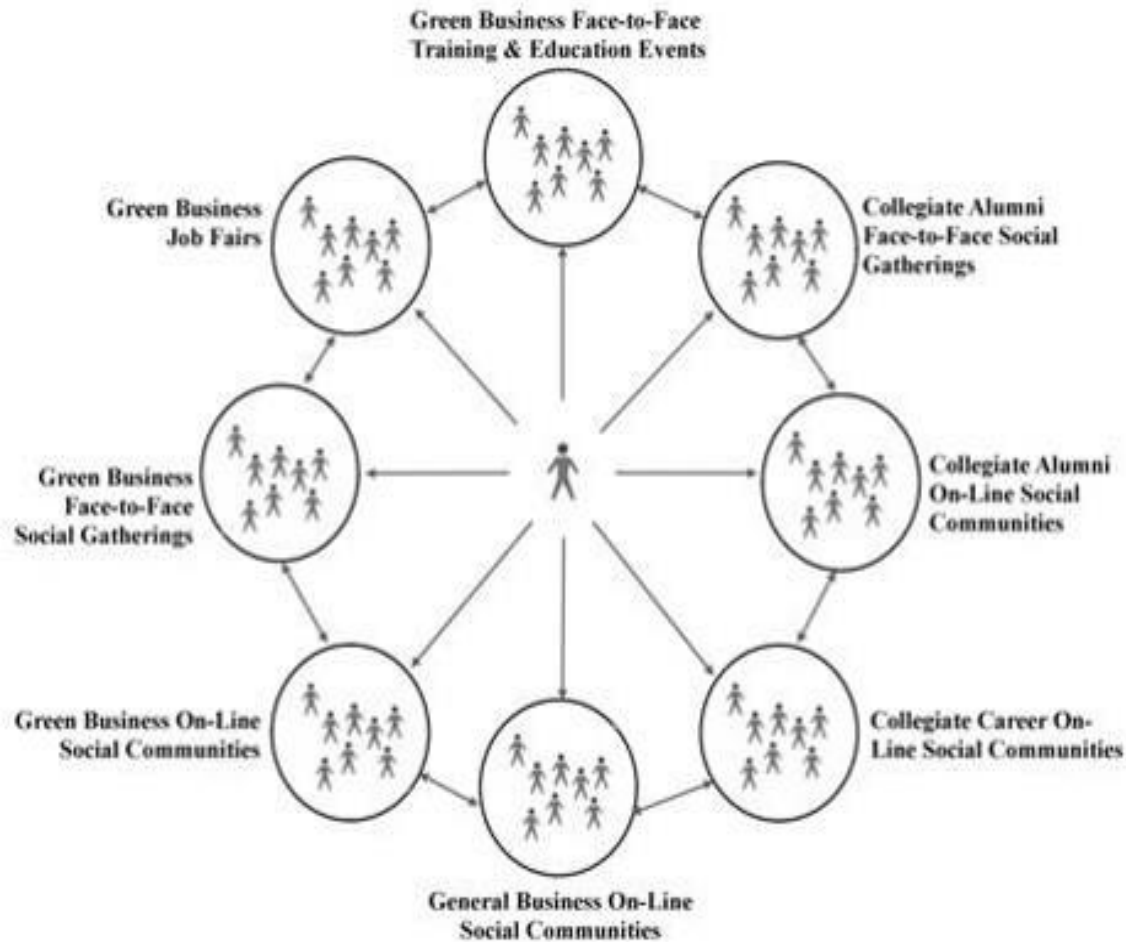
Lori Collins,
Owner and Principal,
Collins Climate Consulting

Follow the money - The wall may have nothing to do with you or your qualifications. It is likely that the organizations you are interested in just don't have the funding or revenue to hire someone right now. Look for organizations that have money - this could be local/state governments, organizations that recently received grants (i.e. The Nature Conservancy just received \$100 million from Amazon), or smaller companies that recently got VC funding or went public. Research online for ideas. There are all kinds of new organizations cropping up around climate change. Here are a bunch of new initiatives you may not be aware of:

1. Release of the [GCA report on adaptation](#) (Global Commission on Adaptation)
2. Release of Climate Bonds Initiative's [Climate Resilience Principles](#)
3. European Bank for Reconstruction and Development's successful issuance of [\\$700 million of first dedicated climate resilience bonds](#); proceeds to fund EBRD's portfolio of climate resilient investments (defined as per CBI's newly released Climate Resilience Principles)
4. Moody's Investor Service's [acquisition of Four Twenty Seven](#)
5. Release of the World Bank's Group [Action Plan on Adaptation and Resilience](#)
6. Launch of the [Coalition for Climate Resilient Investment](#)
7. Launch of Lightsmith's *Adaptation SME Accelerator Project* designed to help build the ecosystem of SMEs involved in adaptation and climate resilience in developing countries through a program of market mapping, convening and network building, and incubation/acceleration.
8. Release of Blackrock's [report on physical climate risk](#)
9. Release of Goldman Sachs' [report on urban climate resilience](#)

Source: Collins Climate Consulting, in addition to conversation with Lori Collins on 4/20/20. From her blog article available at: <https://collinsclimate.com/blog/f/looking-for-a-job>

Tip 2: Build Your Green Professional Network (Finding Opening in Company)



Tip 3: Gain Green Experience at Your Existing Job (and/or Through Volunteering*)

During performance review at your non-green job:

- Met/exceeded your boss's and personal goals
- Established your credibility, reliability
- Propose green projects that you can supervise
- With each success, add more projects
- Exit with real green job experience



*Volunteering is another great way to gain green experience!



Tip 4: Enrich Your Skills & Competencies

Includes on-line learning, continuing education programs, training, certifications, and other professional development training. Examples include:

- Circular Economy Series through Ellen MacArthur Foundation
- Association of Climate Change Officers' Certified Climate Change Professional
- Association of Energy Engineers has 16+ certifications including the Certified Energy Manager
- Toastmasters Communication and Leadership Programs



Career Pathways – US Department of Energy

Bioenergy Careers Pathways
(Also available for
Solar, wind, and fuel cells/hydrogen)



Energy Career Videos:

- Clean Energy Manufacturing
- Heavy Duty Vehicle Efficiency
- Geothermal Energy
- Wind Power
- Fuel Cell Technology
- Energy Efficiency in Commercial Buildings
- Feedstocks for Biofuels and More
- Marine and Hydrokinetic Energy
- Hydrogen
- Electric Vehicles
- Algae to Fuels
- Biofuels
- Solar PV
- Concentrating Solar Power

Source: <https://www.energy.gov/eere/education/eere-energy-101-video-series>

Tip 5: Create Your Own Green Job Guidance Committee

Possible advisors:

- Clean energy/cleantech leaders
- Sustainability managers
- Corporate Social Responsibility experts
- Academics in business and environmental science programs

Utilize LinkedIn and other networking opportunities to find people to build your committee.



Tip 6: Create Your Own Green Job – Become an Eco-Entrepreneur



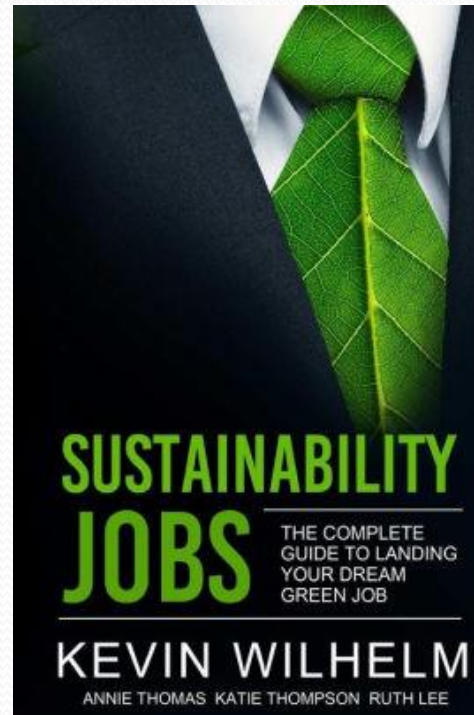
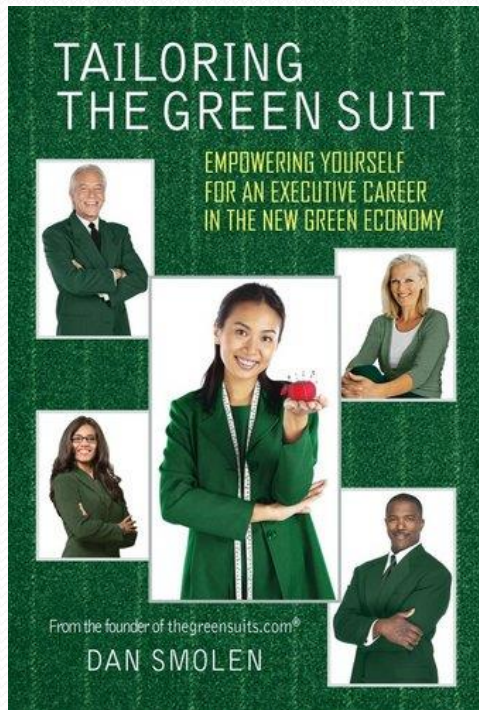
Erin McGoey
Last Call for Food

Example – Bethesda Green’s Innovation Lab

Areas of focus include:

- **Environment:** Clean energy / Water / Climate / Natural Resources / Zero-Waste / Circular Economy
- **Sustainable Food Cycle:** Agriculture / Food Production / Manufacturing / Distribution / Retail
- Recruiting for their Fall Accelerator Cohort. Applications will open soon, but interested entrepreneurs are invited to reach out. The Fall 2020 Cohort will be entirely virtual, and we'll accept submissions from around the United States.
- With regards to guidance related to green entrepreneurship: It should be the same for entrepreneurship for all industries - clearly identify the problem you're solving, develop a solution, and figure out who will pay you for it. As you build your supply chain, develop your product, select packaging, and plan delivery methods, consider ways you reduce or eliminate waste, reduce emissions, and identify sustainable and socially responsible methods of production and supplies.

Additional Green Career Resources



Join Our Community of Leaders to Connect with Others in Green Careers and Pursuits!



- Connect with our on-line community at leadersinenergy.org.
- Write a blog article for us.
- Join our discussion group on LinkedIn, Leaders in Energy Research, Communications, Policy & Analysis – (LERCPA).
- Follow us on our Facebook and Twitter pages.
- Attend our events, working groups, and workshops; and volunteer for an event or serve on our Board and team.

Thank You & My Contact Information



Janine Finnell
Executive Director
Leaders in Energy

leadersinenergy.org
[@LeadersinEnergy](https://twitter.com/LeadersinEnergy)

Email: jfinnell@leadersinenergy.org
Phone: 703-203-0766

