Update on the Integrated Regional Decarbonization Framework

Board of Supervisors
March 16, 2022
Item # 5
The components of the Integrated Regional Decarbonization Framework

- Technical Report led by UC San Diego and USD
- Workforce Development Study by Inclusive Economics
- Implementation Pathways Report
- **Jan. 2021**: RDF Directed
- **July 2021**: July Update
- **Nov. 2021**: Nov. Update
- **Mar. 2022**: Feb. Update
- **Aug. 2022**: March Draft Integrated RDF

**Community Engagement**
- **Aug. 25 - 27**: Focus Groups
- **Sept. 13**: Public Workshop
- **Nov.-Dec.**: Public & Technical Review

**Project Details**
- **Contract with UC San Diego & team**
- **Define scope; energy modeling**
- **Sector-specific data modeling and analysis**
- **RDF Draft released**
- **Draft Local Policy Opportunity Analysis**

**March - August**
- Community, Agency, and Stakeholder Outreach
- Public Comment Period Open Through May 31, 2022

- **Finalize Technical Report Workforce Development Study Implementation Pathways**
## Public Outreach Plan

<table>
<thead>
<tr>
<th>Regional Community Gatherings</th>
<th>Public Workshops</th>
<th>Speaker Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Total: March 24, April 19, May 17, June 28, July 26</td>
<td>5 total: weekly April-May</td>
<td>4 depending on availability of guest speakers: June 2, June 16, July 7, July 21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Direct Engagement Meetings &amp; Presentations</th>
<th>Pop-Up Community Events</th>
<th>Regional Convenings for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-on-one meetings/presentations</td>
<td>Various opportunities to educate a general audience</td>
<td>Events with public officials and stakeholders on implementation pathways</td>
</tr>
</tbody>
</table>
New Engagement Tool

• Learn about the project, ask questions, comment directly on draft documents, and connect with the project team
• Documents available for comment through May 31, 2022
Decarbonization Pathways in Four Sectors

Transportation

Electricity

Land Use

Buildings
Modeling Approach – Energy System

- Pathways analysis of sectors in the regional energy system to reduce emissions to net zero by 2045
  - “Energy system” is the total production and consumption of energy, including electricity and fossil fuels
  - Energy sectors: electricity generation, on-road transportation, and buildings
- “Net zero” here means that anthropogenic (human-caused) carbon emissions equal anthropogenic carbon sequestration, leading to no net carbon entering the atmosphere from the energy system
  - The goal of “net zero” here is that the San Diego region fits within the State and national net zero pathways – not that this region achieves net zero in isolation
- Also analyzed:
  - Land use considerations for the energy system pathways
  - Natural climate solutions that could increase annual sequestration
  - Quantitative jobs analysis for net zero pathways
Comment Period and Process

- Comment period was originally open through December 3rd, 2021
  - New comment period through May 31st, 2022
- The Technical Working Group, stakeholders, members of the public sent in letters and emails with comments
- UC San Diego team pulled comments from letters and organized them by chapter in an excel sheet that was shared with authors. All letters were also shared with authors
  - Authors were asked to address comments as feasible through additional analyses and maps, explanations of assumptions and/or data, more/better explanation of context, etc.
Geospatial New Findings and Additional Analyses

- Wave energy
- Offshore wind
- Rooftop solar
- Potential brownfields for solar and wind
- Geothermal sites
Geospatial New Findings and Additional Analyses

- New scenarios:
  - Rooftop solar and infill solar only
    - This scenario meets 35% of 2050 regional energy demand
    - Average levelized cost of energy (LCOE): $70.04/MWh
  - Regional utility-scale solar and wind:
    - Meets 100% of demand
    - Average LCOE: $40.65/MWh
Geospatial New Findings and Additional Analyses

- New Scenarios
  - “Mid-range scenario” for 2050 - balances competing priorities,
  - Meets 100% of 2050 energy demand
  - Average LCOE: $109/MWh
Co-Benefits New Findings and Additional Analyses

- Geospatial analysis of energy
  - Environmental benefits from different scenarios. Example: New rooftop and infill solar only scenario results in no land use change - minimizing impacts to natural and working lands

- Transportation
  - Health benefits from both vehicle electrification and VMT reduction strategies

- Buildings
  - Health benefits from building electrification due to burning fewer fossil fuels indoors
Technical Report Summary

- The RDF provides quantitative, technical pathways to decarbonization to inform policy-making, highlight trade-offs, uncertainties, decision points, and key takeaways and investments
  - Key takeaways are near-term actions common across pathways, worthwhile regardless of how longer-term uncertainties resolve themselves
  - Examples:
    - Building low-cost renewable energy sites
    - Electrifying transport
    - Reducing VMT
    - Replacing end-of-life water and space heaters with electric alternatives
    - Protecting natural and working lands to maintain natural sequestration
- This report models the entire region as a system to inform an institutional arrangement that promotes coordination and learning across jurisdictions while updating these science-based pathways as technology and costs change over time
Thank you

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School of Global Policy and Strategy  
UC San Diego  
Sustainable Development Solutions Network  

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# Employment Impacts from Climate Investments in the San Diego Region

<table>
<thead>
<tr>
<th>Investment Area</th>
<th>Representative Occupations</th>
<th>Annual Expenditure (in millions)</th>
<th>Direct Jobs</th>
<th>Total Jobs</th>
<th>Average Annual Compensation</th>
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</thead>
<tbody>
<tr>
<td>ENERGY DEMAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>Freight movers, bus drivers</td>
<td>$7,700</td>
<td>3,428</td>
<td>6,362</td>
<td>$62,000</td>
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<tr>
<td>HVAC</td>
<td>Mechanical trades</td>
<td>$897</td>
<td>1,345</td>
<td>2,808</td>
<td>$72,000</td>
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<tr>
<td>Refrigeration</td>
<td>Machinists, laborers, heavy vehicle technicians</td>
<td>$762</td>
<td>1,315</td>
<td>2,517</td>
<td>$77,000</td>
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<tr>
<td>ENERGY SUPPLY</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fossil fuels</td>
<td>Welders, operators, electricians, pipelayers</td>
<td>$4,400</td>
<td>2,538</td>
<td>10,120</td>
<td>$181,000</td>
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<td>Clean Renewables</td>
<td>Misc. trades</td>
<td>$630</td>
<td>1,488</td>
<td>2,937</td>
<td>$97,600</td>
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<tr>
<td><strong>OVERALL WORKFORCE</strong></td>
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<tr>
<td>Full-time year-round</td>
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<td></td>
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<td>$80,900</td>
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</table>
## Employment Impacts from Climate Investments in the San Diego Region

<table>
<thead>
<tr>
<th>Investment Area</th>
<th>Representative Occupations</th>
<th>Healthcare Coverage</th>
<th>Union Membership</th>
<th>Education: High School or Less</th>
<th>People of Color</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY DEMAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>Freight movers, bus drivers</td>
<td>58.1%</td>
<td>14.9%</td>
<td>45.0%</td>
<td>70.0%</td>
<td>20.8%</td>
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<tr>
<td>HVAC</td>
<td>Mechanical trades</td>
<td>53.8%</td>
<td>12.9%</td>
<td>58.8%</td>
<td>70.0%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Refrigeration</td>
<td>Machinists, laborers, heavy vehicle technicians</td>
<td>55.2%</td>
<td>14.7%</td>
<td>60.5%</td>
<td>70.4%</td>
<td>10.7%</td>
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<tr>
<td>ENERGY SUPPLY</td>
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</tr>
<tr>
<td>Fossil fuels</td>
<td>Welders, operators, electricians, pipelayers</td>
<td>82.9%</td>
<td>18.0%</td>
<td>31.1%</td>
<td>62.7%</td>
<td>23.0%</td>
</tr>
<tr>
<td>Clean Renewables</td>
<td>Misc. trades</td>
<td>59.5%</td>
<td>11.5%</td>
<td>46.5%</td>
<td>64.8%</td>
<td>19.0%</td>
</tr>
<tr>
<td><strong>OVERALL WORKFORCE</strong></td>
<td></td>
<td><strong>62.2%</strong></td>
<td><strong>13.3%</strong></td>
<td><strong>33.7%</strong></td>
<td><strong>61.4%</strong></td>
<td><strong>45.8%</strong></td>
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<td>Full-time year-round</td>
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Putting San Diego County on the High Road

• Board directed a comprehensive green jobs plan
• Preliminary report presented today
• Modelled after the State of California’s Jobs and Climate Action plan
Purpose of Presentation

What can we do to make sure that the jobs created by decarbonization are good jobs and there are pathways into them?

What can we do to support workers who may lose their jobs?

**Conclusion:**

With intentional policies and strategic capital investments, climate action can protect and increase high-quality jobs and access to them.
What do we mean by “high-road jobs”?

**Job quality:**
- Family-supporting wages and benefits
- High standards for health and safety
- Long-term career pathways
- Worker protections including the right to organize

**Job access:**
- Access and entry-points to good jobs for local workers
- Training to support advancement

*A win-win approach for employers and community: employers gain access to skilled and committed workers, and community members gain access to good careers.*
How to ensure good outcomes for workers:

**Strategies to support job quality and job access for workers in the growing sectors:**

- Ensure that jobs that are created or expanded are family-supporting
- All demographic groups have access to special training and preparation

**Strategies to support transition for workers in declining sectors:**

- Place workers in jobs with comparable pay, benefits, and working conditions
- Take advantage of new funding for industrial strategies to reduce GHG emissions
- Robust training investments for workers who want to change careers
- Safety nets for remaining workers
The growth side: why do we need to worry about job quality and job access?

Without incorporating workforce goals into climate policy, the transition to a carbon-neutral economy may simply replicate—or even exacerbate—deep-seated trends of wage inequality and disparities by race and gender.

- Workers in “green jobs” are really in greening occupations.
- Most jobs that contribute to reductions in GHG emissions are blue collar, and many are construction jobs.
- Green jobs are not necessarily good jobs, as they follow the same trends as other jobs of the same occupation and industry.
- Blue collar occupations can be low wage, particularly if they are not public sector or unionized.
Low wage trouble spots where policy can improve job quality

- Distributed generation, rooftop solar
- Energy efficiency
- Trucking
- Ride-sourcing/Transportation Network Companies
- Waste management
- Lands conservation and restoration
- Agriculture
- Manufacturing
RDF implementation can incorporate social policies: job quality standards and job access agreements

<table>
<thead>
<tr>
<th>Construction:</th>
<th>Non-Construction:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Project Labor Agreements with Targeted Hire (CWAs)</td>
<td>• Inclusive Procurement Requirements</td>
</tr>
<tr>
<td>• Skilled and Trained Workforce</td>
<td>• Wage and Benefit Standards</td>
</tr>
<tr>
<td>• Prevailing Wage</td>
<td>• Skill Standards</td>
</tr>
<tr>
<td>• Responsible Contractor Requirements</td>
<td>• Community Benefit Agreements</td>
</tr>
</tbody>
</table>
San Diego region can implement best practice training strategies.

- Start with the jobs, partner with employers, and customize by industry.
- Support and enhance existing programs in key workforce development institutions that train for careers, like the many apprenticeship programs in the region.
- Fund comprehensive training that prepares workers for careers, not one technology. Don’t create new niche “green” jobs training programs.
- Key state funding sources: High Road Training Partnerships (HRTP) and High Road Construction Careers (HRCC).
## Job Policies for Buildings

| Non-Residential Building Decarbonization | • Require “skilled and trained” workers are involved in large-scale commercial building decarbonization projects.  
• Invest in decarbonizing and upgrading the region’s public buildings under a Community Workforce Agreement, to ensure middle class wage and benefit standards and expand hiring of workers from disadvantaged communities. |
| Small Commercial and Residential Building Decarbonization | • Support electric-ready buildings by aggregating neighborhoods for electric service upgrades, performed by pre-qualified contractors.  
• Develop a fund for deep decarbonization of the region’s affordable housing, to support high-road jobs in this sector while reducing energy burdens for low-income renters.  
• Pre-qualify Responsible Contractors seeking incentives for electrification. |
## Job Policies for Energy

<table>
<thead>
<tr>
<th>Energy Subsector</th>
<th>Requirements</th>
</tr>
</thead>
</table>
| Utility-Scale Solar, Wind, Battery Storage, Geothermal, etc. | • Require CWAs on the construction of renewable energy projects.  
• Support job quality on the operations and maintenance of local renewable energy projects. |
| Distributed Solar and Storage            | • Support models of distributed solar that are community scale rather than on individual homeowners’ roofs, to both lower costs per MW and to facilitate contracting models that support high road jobs.  
• Ensure licensing and electrical certification requirements reflect the hazards and risks associated with battery energy storage systems. |
| All Energy Subsectors                    | • Incorporate responsible employer prerequisites in incentive programs that require compliance with all applicable labor and employment laws and set family-sustaining wage and benefit standards. |
## Job Policies for Transportation Electrification

<table>
<thead>
<tr>
<th>Electric Vehicle Charging Infrastructure</th>
<th>• Adopt the requirement that electric vehicle charging stations be installed by EVITP-certified electricians.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit and Fleet Purchases of Electric Vehicles</td>
<td>• Use inclusive procurement policies, such as the U.S. Employment Plan, for purchase of zero emissions buses and other fleet vehicles by public agencies.</td>
</tr>
<tr>
<td>Electrified freight and efficient distribution</td>
<td>• Support EV charging for freight at distribution centers and give preference to firms that utilize employees rather than independent contractor drivers.</td>
</tr>
<tr>
<td>Electric Vehicle TNC subsidies</td>
<td>• Incentivize cleaner vehicles for TNCs, attaching responsible employer policies to subsidies.</td>
</tr>
</tbody>
</table>
## Job Policies for Transportation: Lowering Vehicle Miles Traveled

| Expand transit services | • Require community workforce agreements on transit infrastructure expansion.  
|                        | • Expand funding for public transit operations, maintaining current high road jobs.  
|                        | • Support innovative programs that incorporate micro-transit services for first- and last-mile mobility as part of public transit systems.  
|                        | • Incorporate worker protections and labor standards in comprehensive regulations of TNCs that also address congestion and vehicle miles traveled (VMTs), e.g., through licensing or rules and fees on access to curb space and public streets.  
|                        | • Invest in TNC partnerships in rural and non-infill areas, prioritizing zero emissions vehicles, while piloting public rideshare using transit worker union drivers.  
| Infill and Transit Oriented Development | • Encourage development to zoning capacity limitations and 4+ story buildings, requiring skilled and trained craft laborers. On competitive grants for infill projects, include scoring criteria that factor in job quality and job access.  
| Accelerate SD Regional Bicycle Plan and develop pedestrian safety plan | • Implement a community workforce agreement for all active transportation infrastructure in the region.  

## Job Policies for Lands

<table>
<thead>
<tr>
<th>Restoration, reforestation, and urban greening</th>
<th>• Expand public sector employment for these activities or incorporate job quality standards and job access agreements into contract requirements for this work.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon farming in agriculture</td>
<td>• Condition financial support on sites that have health and safety plans that account for the hazards of climate change on workers’ well-being.</td>
</tr>
<tr>
<td>Protect and restore wetlands</td>
<td>• Expand public sector employment for these activities or incorporate job quality standards and job access agreements into contract requirements for this work.</td>
</tr>
</tbody>
</table>
We think this can be accomplished in the San Diego region!

Because:

• Relative minor dependence of jobs on fossil fuels
• Alignment of vision and pro-active approach by economic development leaders
• Unique moment of federal investment in emerging climate technologies
RDF implementation can include specific investments that contribute to climate mitigation and redeploy fossil fuel workers.

- Waste to Energy
- District Thermal Energy
- Lithium Valley
- Onsite Water Reuse

This takes planning and stakeholder engagement!
Examples of Planning Ahead for Alternative Climate Infrastructure Investments

• Pilot projects to strategically decommission gas distribution systems in neighborhoods to convert to carbon-free district energy, installed by gas infrastructure workers. The U.S. Department of Energy suggested district energy systems could expand from 17 today to 17,000 in 2050. The San Diego region should explore these solutions early, in order to scale them appropriately.

• Pilot waste-to-energy biomethane projects or green hydrogen demonstrations. These can also employ gas infrastructure workers. These will be important technologies for hard-to-electrify end uses, such as industrial process heat. Gaining experience with these technologies, and exploring the job impacts early is worthwhile.
Transition and safety net programs for displaced workers

Preparation is needed in case redeployment is incomplete.

1. Bridges to retirement and pension guarantees for all workers in fossil fuel-based industries.

2. Wage insurance for all displaced workers who get placed in lower wage jobs.

3. Retraining support that includes career counseling, stipends during training, and job placement.
Develop a technical assistance team to help local agencies identify and incorporate labor standards recommended in this report.

Assess need to shore up pre-apprenticeship via HRCC funding, and develop industry training partnerships, via HRTP funding.

Convene a just transition task force that includes affected stakeholders

- Research on specific situation and needs of workers facing job loss
- Identification of climate and public investments that could redeploy workers
- Development of partnerships for federal and state funding opportunities
- Negotiated package for safety net, including bridges to retirement and wage insurance
- Comprehensive approach to retraining support for workers who will change careers
Next Steps for the RDF
Other Considerations & Board Direction

Social Equity
Alternative Renewable Energy Sources
Regional Collaboration
Local, Sustainable Agriculture & Food System
## Implementation Pathways Design and Development

### Phase 1: Short and Mid-Term Implementation

- Set the path for action
- Develop a set of options for short, mid, and long-term actions
- Program design
- Evaluate feasibility of mid-term actions

### Phase 2: Long Term Implementation

- Regional convenings
- Bring together stakeholders
- Gather feedback to refine implementation pathways
The Team: Contracts

Technical Report

Workforce Development Study

Implementation Pathways

INCLUSIVE ECONOMICS

UC San Diego
August Board Update

Technical Report led by UC San Diego and USD

Workforce Development Study by Inclusive Economics

Implementation Pathways Report
Today’s Board Action

Receive the Report

- Revised technical report and draft workforce development study

Approve Contract with USD EPIC

- Consulting services for implementation support
County of San Diego

Update on the Integrated Regional Decarbonization Framework

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