Checklist for Creating a Regional Decarbonization Framework

This checklist is meant to summarize the series of tasks needed to create a regional decarbonization framework according to the example process used to develop the San Diego RDF. Users should tailor these tasks to best suit the needs of their local context.

- [ ] **Task 1: Conduct Initial Stakeholder Outreach**
- [ ] **1.0 Research greenhouse gas emissions inventories or local climate action plans**
- [ ] **1.1 Identify potential framework stakeholders and collaborators**
- [ ] **1.2 Participate in stakeholder meetings**
- [ ] **1.3 Conduct interviews with subject matter experts**
- [ ] **1.4 Prepare scoping document**
- [ ] **Task 2: Technical Framework Modeling and Analysis**
- [ ] **2.0 Consult with a local modeling team to determine what kind of modeling methodology will be used in your analysis**
- [ ] **2.1 Collect data required for modeling**

Regional Up/Downscaling: Identify any local, regional, state, or national decarbonization pathways analyses on which to align your own assessment for scaling purposes later.

Electric Power Sector Analysis: Spatial analysis to identify low-impact, high quality, technically feasible areas for renewable energy infrastructure development, and to coordinate the early planning of the transmission network needed to interconnect new, low-impact renewable energy power plants (and/or distributed resources) to the grid.

Land Use Analysis: Identify bioenergy opportunities,[1] negative emissions technologies, and ecological conservation and restoration considerations.

Transportation Analysis: Spatial analysis to identify opportunities for alternative modes of transport, vehicle electrification, and reduction of vehicle miles traveled.

Buildings Analysis: Use existing data sources to characterize buildings stock in the region and estimate efficiency (appliance and building shell), as well as fuel switching/decarbonization potential over time. Estimate energy use and emissions by sector and building type over time, estimating impact of fuel choice in new and existing buildings. Quantify monetary costs and benefits of different scenarios, coordinating with the energy system model. Analyze gas pipeline economics and customer fuel choice impacts.

1 In doing so, recognizing the current debate about the true decarbonization potential of bioenergy, despite it being described as an essential part of a global net-zero energy system (e.g., by the International Energy Agency, https://www.ieabioenergy.com/wp-content/uploads/2022/04/IEA-Bioenergy-Annual-Report-2021.pdf, and the IPCC, https://www.ipcc.ch/site/assets/uploads/2018/03/Chapter-2-Bioenergy-1.pdf). While some research promotes bioenergy as a carbon-neutral energy source, other research suggests that emissions resulting from biofuel production and use, including those from indirect land use change and across the whole value chain (plant growth, crop harvest, transportation, conversion, and final distribution), may be higher than those generated by fossil fuels (https://iopscience.iop.org/article/10.1088/1748-9326/aaa512/meta). Additionally, the time scales for emitting and storing carbon in the biosphere are often misaligned with land use management strategies and emission reduction goals.

Industrial Analysis: Identify which industrial sectors are relevant and the local labor unions or private sector corporations which manage these sectors. Make sure to involve these partners early on in the project scoping period.

Jobs Analysis: Highlight considerations for an equitable and just transition to decarbonization, so that policymakers are cognizant of consequences of policy decisions for jobs and distributional impacts of policies across demographic groups.

Policy Analysis: After detailing the physical system transformation, connect the infrastructure plan to policy levers at your jurisdictional level and at the state and federal policy level to identify synergies and potential challenges.

- [ ] **2.2 Conduct modeling and other analysis (e.g., sector-by-sector, geospatial, jobs, policy)**

- [ ] **2.3 Prepare draft report on technical framework for decarbonization**

- [ ] **2.4 Participate in an intensive community engagement campaign**

  Share framework scoping and initial results with local communities and solicit feedback to promote an inclusive process, identify gaps, contextualize findings, and obtain important qualitative factors that would otherwise be omitted by the modeling analyses (e.g., divergent views across stakeholder groups and cultural perceptions).

- [ ] **2.5 Prepare non-technical summary for communication of findings to the general public**

- [ ] **Task 3: Conduct Local Policy Opportunity Analysis**

- [ ] **3.1 Develop and/or update related policy databases**

  Either create or find updated databases of existing federal, state, and local regulations to capture the most recently adopted laws and policies related to GHG reduction activities in the sectors evaluated in Task 2. This effort will also update the databases to include all local ordinances related to GHG reduction activities, as well as those regulations that challenge decarbonization efforts.

  Include a careful review of any local climate action plans that should be mapped in the overall framework to identify synergies and gaps. Further, any large private sector commitments or efforts in your region should also be included in these databases in order to align these trajectories with the overall regional framework.

- [ ] **3.2 Conduct Gap Analysis**

  Compare the decarbonization pathway(s) and policy actions described in Task 2 with the inventory of regulations and policies from Task 3.1, including those spanning across jurisdictions to understand the extent of existing policy action and to identify gaps. The policies should also be evaluated alongside their implementation schedules and associated financial measures and resources in order to examine feasibility.

3.3 Identify Local Policy Opportunities

Based on the comparison in Task 3.2, identify how existing GHG reduction efforts can be leveraged to reduce carbon emissions in the region, and describe additional actions that can be taken, either through individual agency action or collectively, to meet the goal of regional carbon neutrality.

3.4 Prepare Final Report

Bring together the technical framework report from Task 2.3 and the local policy opportunity analysis from Task 3.3 into a final single integrated report.

Task 4: Implementation through Science-Based Policymaking

4.1 Create a region-wide institutional governance structure for decarbonization

Organize this evolving structure into a Regional Steering Committee, Sector Working Groups, and Front-Line Advisors (see Figure 4) to coordinate ongoing learning and experimentation across jurisdictions and stakeholders.

Supplement this structure with a conference of governments that regularly convenes policymakers and local stakeholders and facilitates coordination.

4.2 Establish implementation playbook based on scientific models

Create ambitious, adjustable, collective sectoral and policy milestones anchored in technically feasible solutions that are tailored to your local context. Adding decadal milestones can align planning with aging infrastructure and can mitigate stranded assets.

4.3 Prioritize near-term, "low regret" policies

Adapt policies, programs, and incentives to work in the varied political, economic, and socio-environmental contexts of your region and prioritize sector-specific solutions that will be worthwhile regardless of how longer-term uncertainty resolves itself.

4.4 Establish incentives and penalties to mobilize action

Incentivize active learning and experimentation to test diverse ideas, collaboration to assess solutions across jurisdictions, adjustment of policies in light of new information, and breaking away from old investment patterns that will not achieve deep decarbonization.

4.5 Engage continuously with outside agencies to influence policy and generate action beyond your jurisdiction

Actively engage with higher levels of governance to generate influence and advocate for policies and programs that support local decarbonization needs. Additionally, engage with external efforts to create followership among others and discover solutions being developed outside of your jurisdiction. Formal agreements with other agencies or jurisdictions, both in and outside your region, can be established, for example, via Memoranda of Understanding or Joint Powers Agreements.