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Methodologies and Tools Related to Assessing Benefits of Research and Development Investments

1. How big is the market in California if the R&D is successful? For example, a past EPIC grant funded ultra tall wind tower R&D. Those tall towers aren't likely going to be installed in CA for all kinds of reasons. They are important for the south east states where wind turbines have to be super tall to be effective.
2. How costly is it to develop the market? For example, off shore wind in CA needs to be on floating platforms. This is always going to be expensive. To make offshore wind economically viable, other benefits than LCOE need to be accounted for, but those other benefits will raise up the value of less expensive options as well.
3. Are others developing the technology? For example, there are many ultra tall turbine and offshore floating wind turbine technologies that are being funded by other governments and industry. Why should the CEC use its limited money to help?
4. At a fundamental level, the state doesn't really know much about its wind resources, especially its near ground wind resources in existing wind farms. If the CEC would reevaluate its 1985 Wind Atlas information that shows a huge near-ground wind potential in its Wind Resource Areas and in other locations around the state, it could better assess the value of supporting technology R&D to harness that presently wasted energy.
5. Many R&D funding agencies (e.g. in Scotland) use a company's business plan to assess the benefits of R&D. A well documented plan should show a clear path to a viable market in California. The CEC can train its staff or bring in consultants to relatively quickly determine which plans are reasonably viable in bringing a technology through the commercialization process in a reasonable amount of time.
6. R&D grants parameters should not be set in stone for three year periods. This limits good R&D areas of funding that haven't been selected the year or so before the 3 year period starts. That is a long time for a company that is advancing a technology to have to survive before it can receive grant funding. There should be an open category of R&D that allows flexibility to respond favorably to R&D opportunities that the EPIC program either didn't consider or didn't know enough about earlier.
7. The methodology should look at where the technology is in the technology readiness level process and who funds which parts of the process. For example, angel and VC investors will fund early stages in the R&D process but not the final stages of Full Scale prototype, Pilot Project and Certifications (TRL 6, 7, & 8). These steps can be very costly at a time when the company cannot earn revenues because it doesn't have a

product yet to sell. This is stage is called the technology Valley of Death for a reason.

8. The CEC should include in its methodologies the option that the grantee for R&D funds can provide the state with shares in the company (similar to how VCs and angels are rewarded for their investment). The risk in creating a successful R&D grant may not be much lower, but the upside for the state will be higher. SMUD is doing this with the technology R&D it is supporting.