



CLIMATE IMPACT ASSESSMENT FOR EARLY-STAGE VENTURES: SUPPLEMENTAL MATERIALS

Prepared by **Scott P. Burger**

Early-stage investors currently lack a standardized set of tools or metrics that describe the potential impact of their investments. PRIME Coalition and NYSERDA partnered to help fill this gap, authoring the report titled Climate Impact Assessment for Early-Stage Ventures. The report, which accompanies this document, details a process for consistently estimating the potential impact of an early-stage venture using standardized data and methods. This document summarizes and compares the results of two case studies developed using the methods described in the accompanying report. Readers can reference the detailed calculations in the accompanying spreadsheets titled “PRIME-NYSERDA Climate Impact Assessment Case Study_SPVCo” and “PRIME-NYSERDA Climate Impact Assessment Case Study_ElectricAirCo.”

The two case studies summarized here are intended to demonstrate the applicability of the methods described in the accompanying report. SPV Co. is a hypothetical startup developing a novel, highly efficient solar photovoltaic (PV) technology, while Electric Air Co. is developing an all-electric aircraft.

Three cases are developed for each company: a conservative case, a base case, and an aggressive case. The three cases differ in the emissions intensity of the electric power grid (that is, greenhouse gas emissions (GHG) per unit of electric energy produced). For SPV Co., the cases determine the total solar PV market size, which ultimately determines the magnitude of SPV Co.’s deployments. For Electric Air Co., the cases determine the emissions created when charging the batteries that Electric Air Co.’s aircrafts use.

The Emissions Reduction Potentials – that is, the potential emissions reduced by each company between 2018 and 2048 – are summarized for each case in the table below.

Case	SPV Co. ERP (Million tonnes of GHG)	Electric Air Co. (Million tonnes of GHG)
Conservative	483	-2,717
Base	472	68
Aggressive	45	9,525

We see that, while SPV Co. always has a positive ERP, Electric Air Co. may actually result in a net increase in emissions (a negative ERP) in the conservative case. SPV Co.’s ERP is lower in aggressive cases, as, in these cases, the emissions displaced are lower due to a relatively cleaner grid. For Electric Air Co., a dirty grid in the conservative case means that jet fuels are cleaner than utilizing grid energy. While the maximum potential impact of Electric Air Co. is higher than that of SPV Co., the average impact of SPV Co. is higher than that of Electric Air Co.

The assumptions used in each case study are summarized in the table below.

	SPV Co.	Electric Air Co.
Emissions of the product displaced	<ul style="list-style-type: none"> • SPV Co. displaces grid energy • Global average electricity emissions factors are utilized • Future grid emissions derived from IEA cases 	<ul style="list-style-type: none"> • Electric Air Co. displaces passenger travel powered by jet fuel • 35% efficient jet engines assumed • Emissions per kilometer taken from MIT study on environmental impacts of air travel • Emissions per kilometer decreasing at an annual rate equivalent to historical trends.
Additionality	<ul style="list-style-type: none"> • Additionality estimated as the increase in efficiency of solar PV products relative to a base case • Base case efficiency taken from International Technology Roadmap for Photovoltaic • Assumed no increase in market size due to SPV Co.'s product 	<ul style="list-style-type: none"> • 100% additionality assumed • Assumed no increase in market size due to Electric Air Co.'s product
Emissions of the venture's product & emissions reduced by products sold	<ul style="list-style-type: none"> • Assumed 95% of total lifetime emissions are displaced, with 5% embodied in product manufacturing 	<ul style="list-style-type: none"> • Emissions of the venture's product calculated as emissions created in battery charging • Global average electricity emissions factors are utilized • Future grid emissions derived from IEA cases
Potential product deployment	<ul style="list-style-type: none"> • Assumed SPV Co. reaches 50% market share in 18 years • Solar PV market sizes derived from IEA cases 	<ul style="list-style-type: none"> • Assumed Electric Air Co. reaches 50% market share in 18 years • Aviation market size derived from Boeing market growth estimates

While the assumptions seem numerous, we find that relatively few assumptions are unique to the company being analyzed. That is, the assumptions with the largest impact on the potential emissions reduction of each company – the deployment of the company's product and the emissions displaced by the product – are taken from third party reports or studies. This allows for relative comparisons to be made between SPV Co. and Electric Air Co., despite the different natures of these companies. These cases highlight how the methods described in the accompanying report, *Climate Impact Assessment for Early-Stage Ventures*, can be used to compare the potential emissions impact of very different companies.

The methods described in the report and utilized in these case studies are far from perfect. It is our goal to refine these methods and increase standardization over time. However, we clearly demonstrate that it is possible to perform rigorous assessments today, and furthermore demonstrate why performing such assessments is critical to advance the early stage impact investing industry. We hope that these case studies and the accompanying spreadsheets shed light on this crucial issue.