Can Carbon Dioxide Removal (CDR) Help 41 Cooper Reach its Carbon Removal Goals?

Elyse Taglia, Iram Rahman

What is Local Law 97 & How does it Affect Cooper?

- Project objective: Analyze three different Emission Reduction Strategies (EMS) in accordance with Local Law 97
- Emission Reduction Strategies: Manual energy conservation measures, electrification, and Direct Air Capture (DAC)
- In-depth financial analysis conducted on each option and an optimized hybrid of each option is presented
- Buildings account for approximately two-thirds of greenhouse gas emissions in New York City
- Mayor de Blasio's plan to make the city carbon neutral by 2050 includes reducing emissions from largest buildings by 40% by 2030 and 80% by 2050
- Local Law 97 Advisory Board and Climate Working Groups established to advise the city on meeting sustainability goals
- Cooper Union has already made changes to reduce carbon emissions, with multiple ECMs recommended and three in place

Feasibility of EMS Options

ECMs

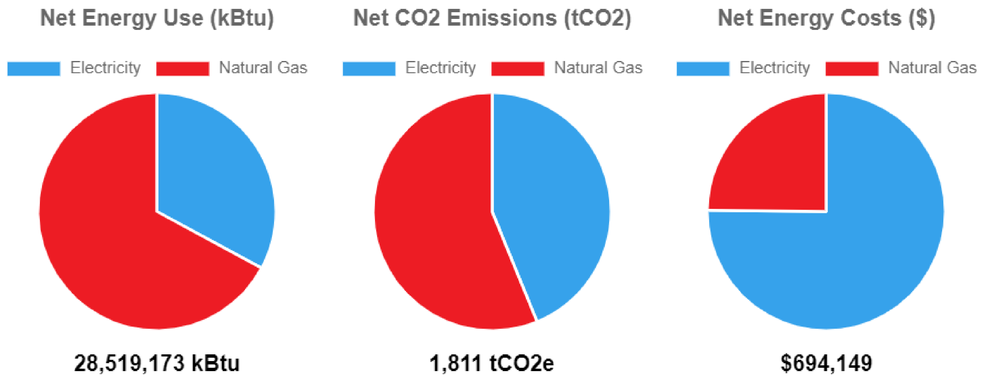
- Received evaluation considering different energy optimization measures & their cost
- Overall, a minor portion of needed emissions & most solutions presented by Smith Engineering are not financially viable

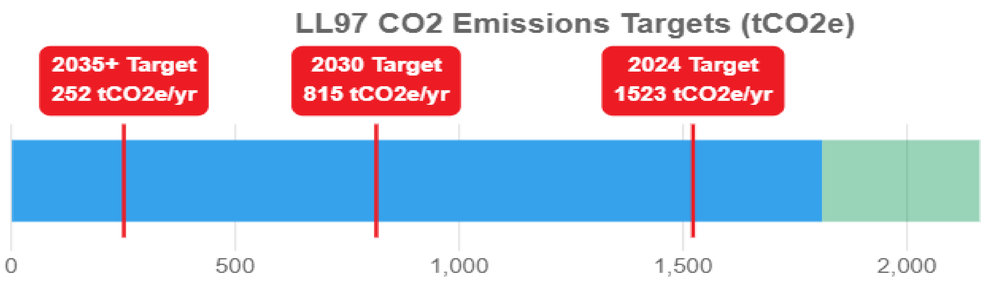
Electrification

- Limited in terms of space, never has been done on such a large scale
- Serious implications with regards to the local energy grid & successful operation of 41 CS

Direct Air Capture (DAC)

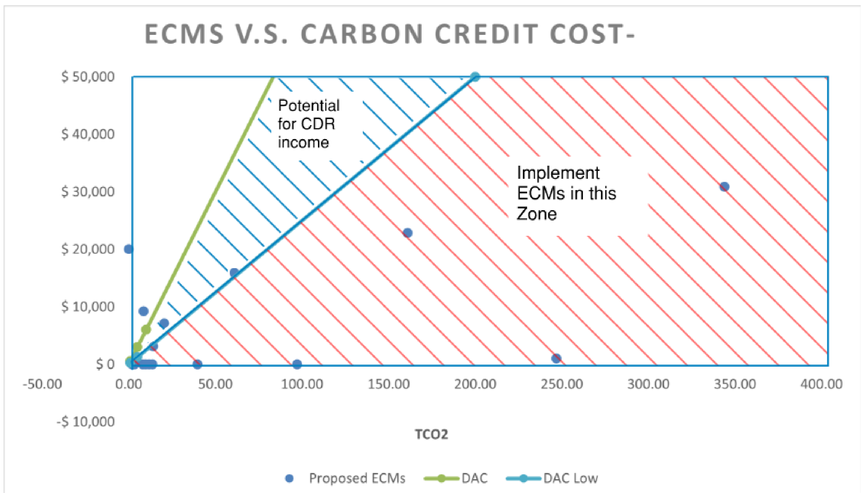
- Any DAC must have direct affects on 41 CS emissions, and must be seen on either the output carbon sensors or on gas usage (renewable fuel)
- Comparison to carbon credit costs: between $250 - $600 per credit





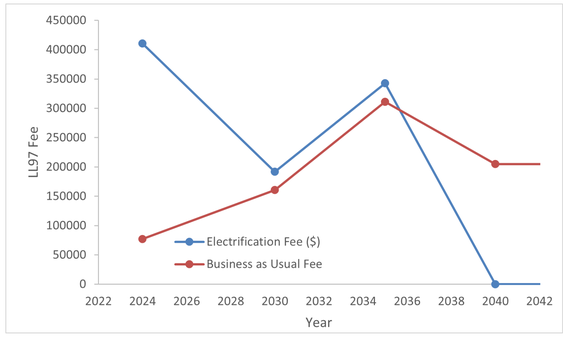
2024-2030 Timeline: DAC and ECMs

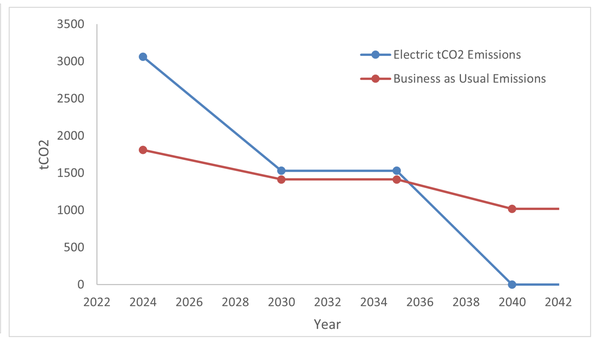
- LL97 does not allow the sequestering of carbon as an official method of reducing carbon emissions
- Focus on implementing as many ECMs as possible
- Potentially sequester carbon & generate carbon credits as another source to fund LL97



Future for 41CS and LL97

Electrification is Not Efficient… Right Now…



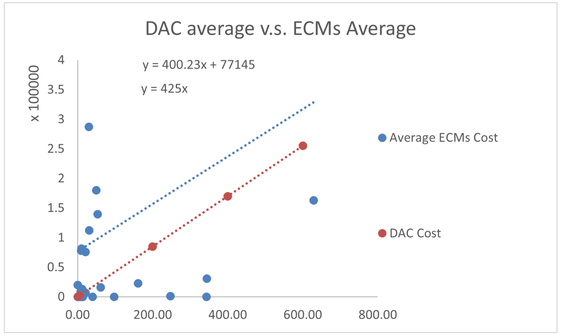


	2024	2030	2035	2040
Carbon Intensity of the Grid Supply	0.55 short ton/KWH	0.35 short ton/KW	0.18 short ton/KW	0.0 short ton/KW

Proposal

- Plan to continue implementing ECMs as often as possible
- If we implement ECMs efficiently it does not make sense to electrify until 2040
- Begin research & contacting companies that offer electric boilers
- Determine if NYC will allow energy needed for electrification
- Plan to implement electric boilers in 2040 → Planning in 2036!

Future CDR



- Focus on DAC credits if possible
- Continue implementing ECMs throughout the following years
- Begin to financially analyze & plan for implementation of electrification of boilers