

Biofuels and Opportunities in Prairie Agriculture

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Agenda

- Proposed Clean Fuel Standard
- Experience in California and British Columbia
- Canadian Prairie Advantages
- Challenges Moving Forward
- Conclusions

Clean Fuel Standard

- The Government of Canada announced in late 2016 that it would develop a Clean Fuel Standard (CFS) to reduce Canada's greenhouse gas emissions (GHG) through the increased use of lower carbon fuels, energy sources and technologies.
- The intent is that the CFS would be a performance-based approach that would incent the use of a broad range of low carbon fuels, energy sources and technologies, such as electricity, hydrogen, and renewable fuels, including renewable natural gas. It would establish lifecycle carbon intensity requirements separately for liquid, gaseous and solid fuels, and would go beyond transportation fuels to include those used in industry and buildings.
- The objective of the CFS is to achieve 30 megatonnes of annual reductions in GHG emissions by 2030. 23 megatonnes is the target for the liquid fuel stream.
- The Government of Canada is working on a phased approach to the implementation of the CFS where the liquid fuel stream would be addressed first and then the gaseous and solid streams would follow.

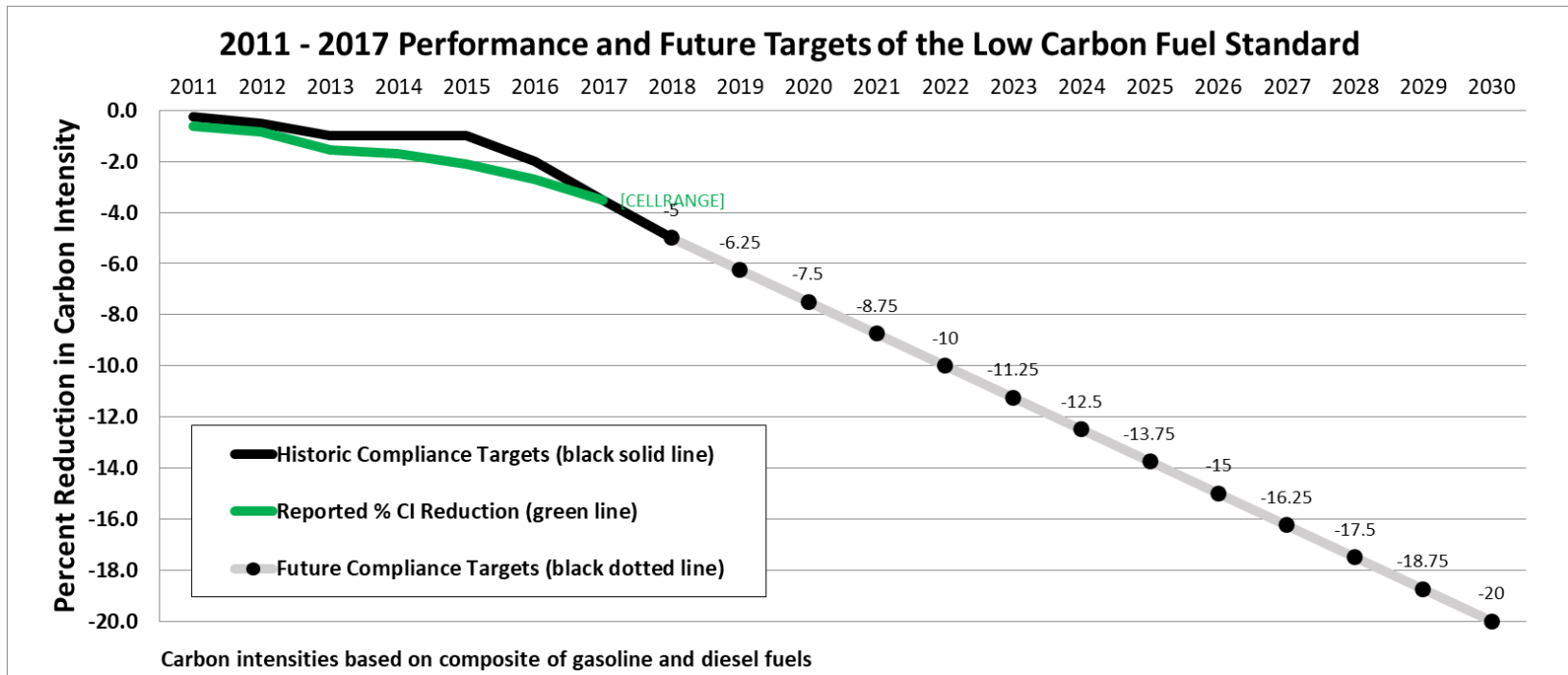
Clean Fuel Standard

- Clean Fuel Standards for transportation fuels have existed in California and BC since 2010 and in Oregon since 2015. So there is some experience with these types of programs.
- The Canadian CFS enters uncharted waters by looking at the gaseous and solid streams and looking at it on the basis of the state of the energy rather than on the use of the energy.
- To add to the uncertainty the Government has decided to develop their own LCA tool rather than use an existing tool that they had access to.
- This new tool won't be available until the spring of 2020.
 - After the targets are set and after the regulation has had a cost benefit analysis done as part of Canada Gazette 1

Clean Fuel Standard

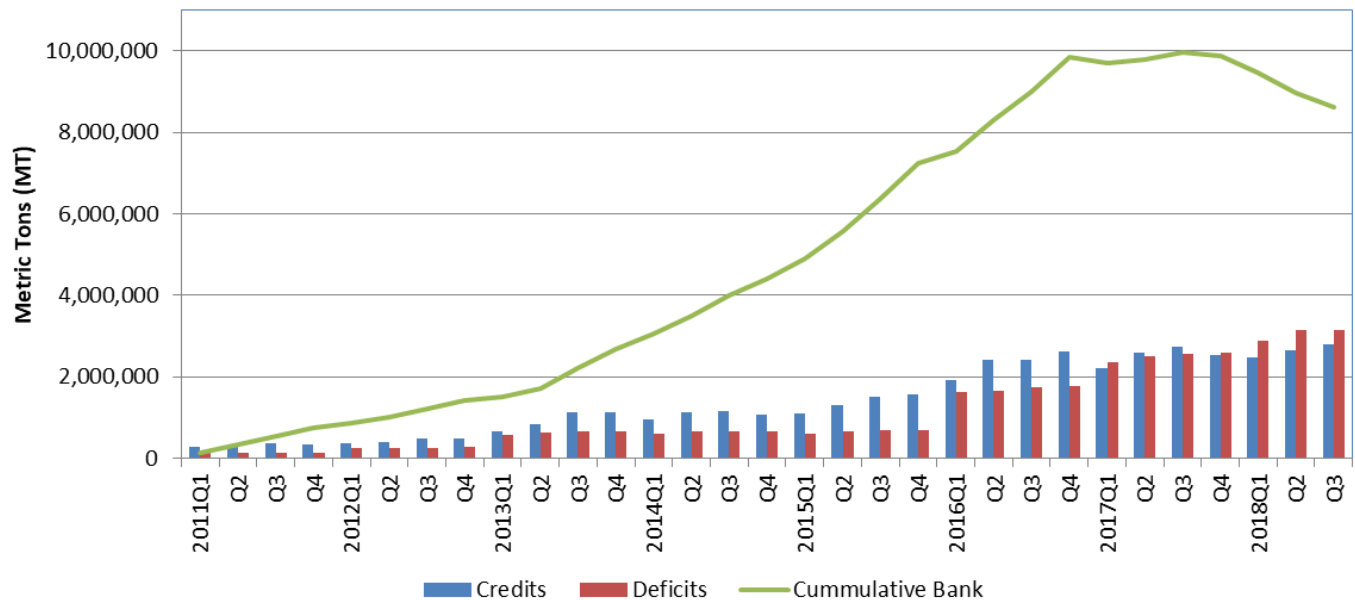
- 23 megatonnes is about an 11% reduction in the lifecycle GHG emissions of liquid fuels.
 - BC and California had a 10% reduction target between 2010 and 2010.
 - They have since extended the target to 20% by 2030.
- An 11% reduction in gasoline CI would require an ethanol blend rate of 30% if that was the only compliance option. This would require 34 million tonnes of feedstock.
- An 11% reduction in the diesel pool would require a biodiesel/renewable diesel blend rate of about 15%. This would require 10 million tonnes of canola.
- But there are other compliance options, electric vehicles, NG heavy duty trucks, CCS, refinery improvements, oil production improvements (possibly even including oil that is exported), and paying into an emission reduction fund.

California Experience



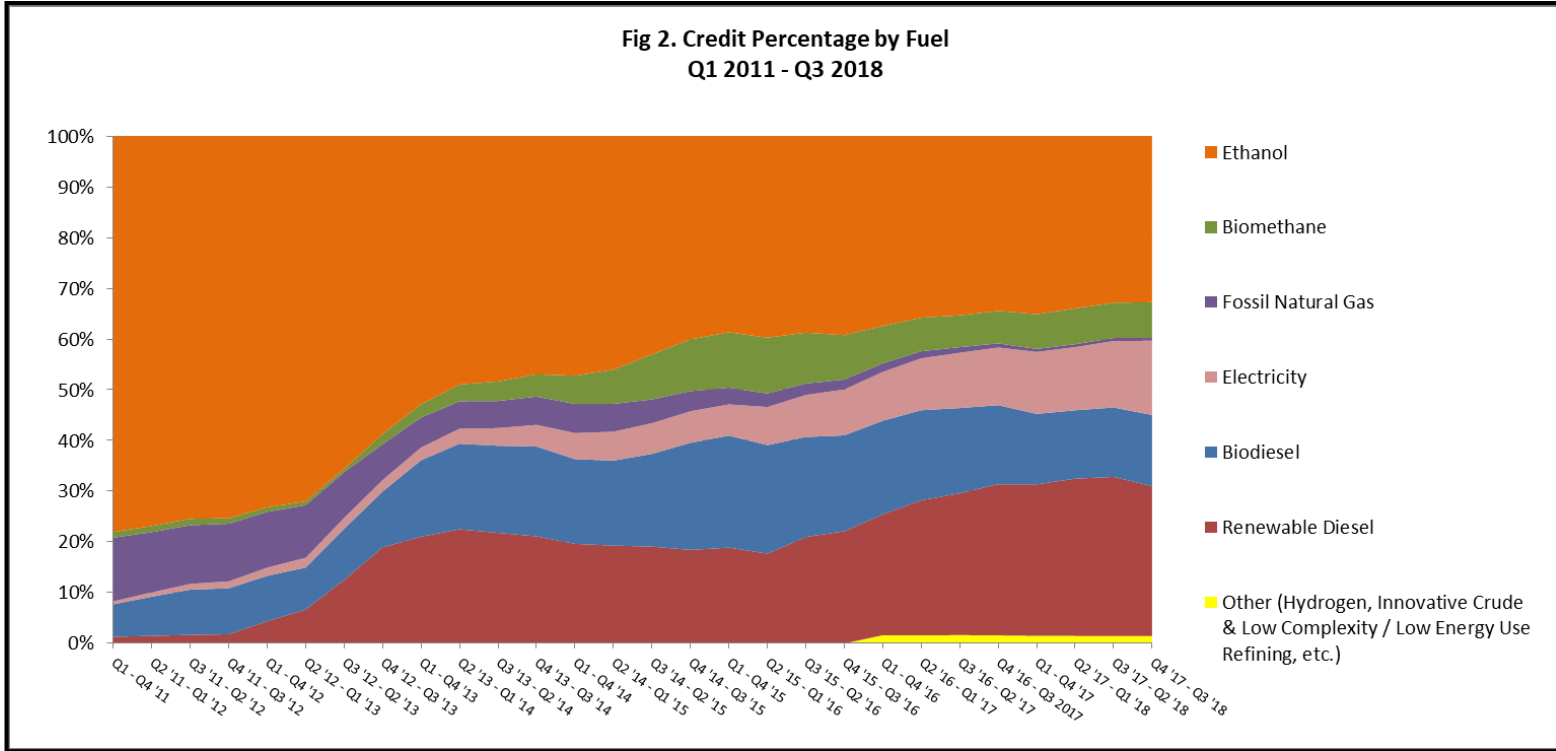
California Experience

Fig 1. Total Credits and Deficits (MT)
for All Fuels Reported Q1 2011 - Q3 2018



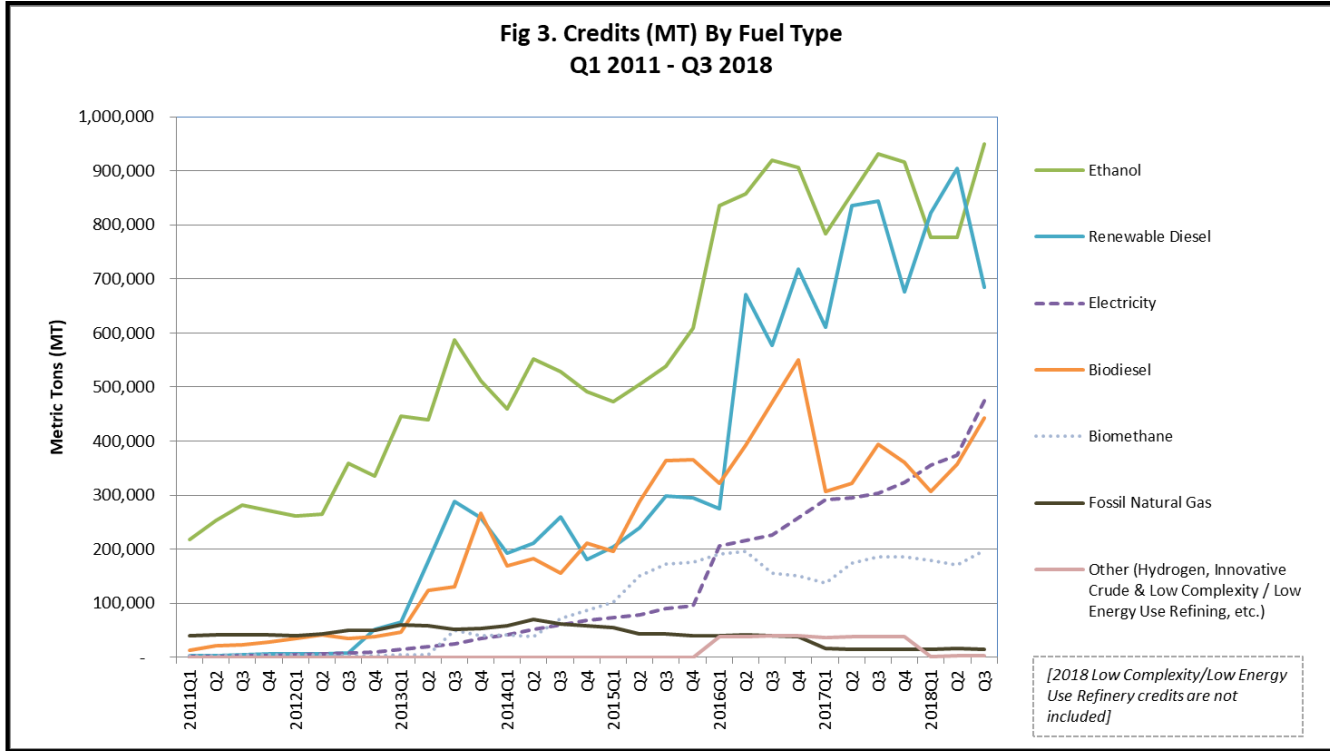
California Experience

Fig 2. Credit Percentage by Fuel
Q1 2011 - Q3 2018

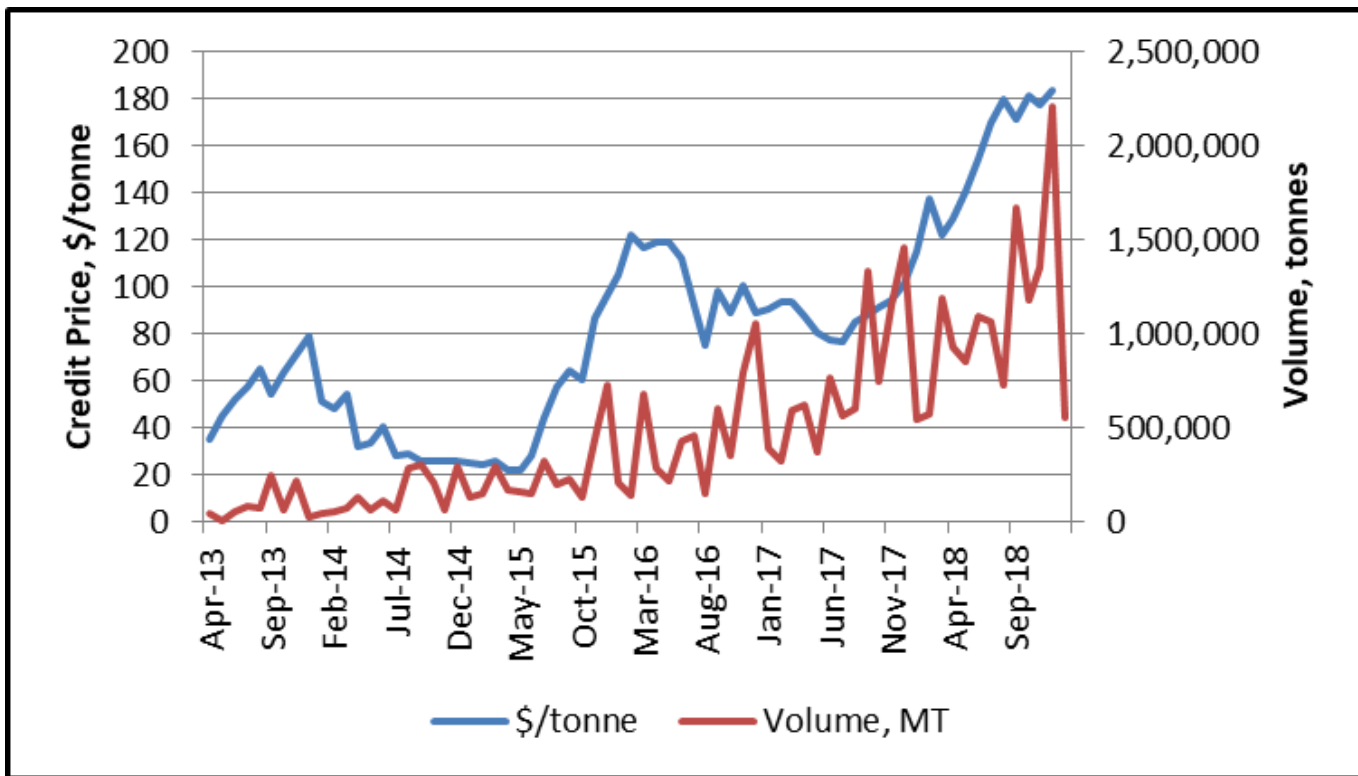


California Experience

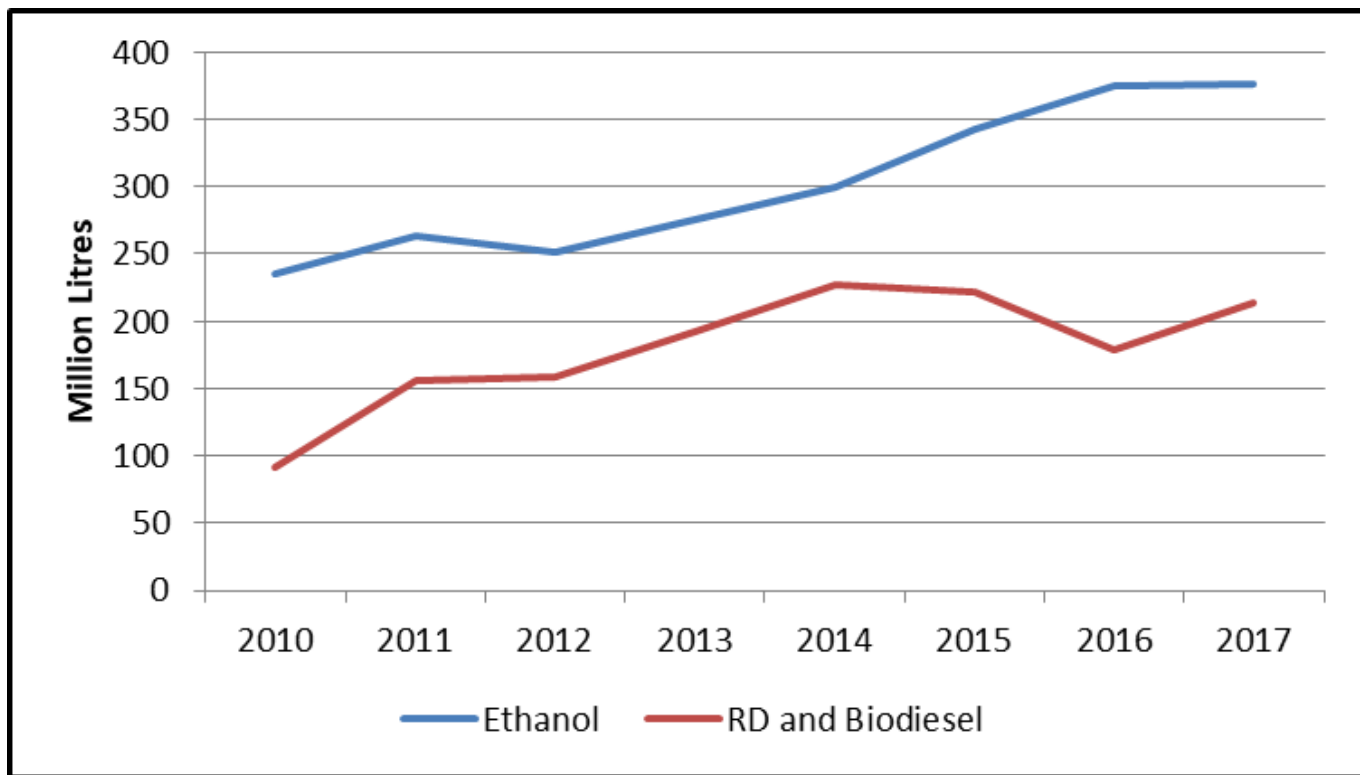
Fig 3. Credits (MT) By Fuel Type
Q1 2011 - Q3 2018



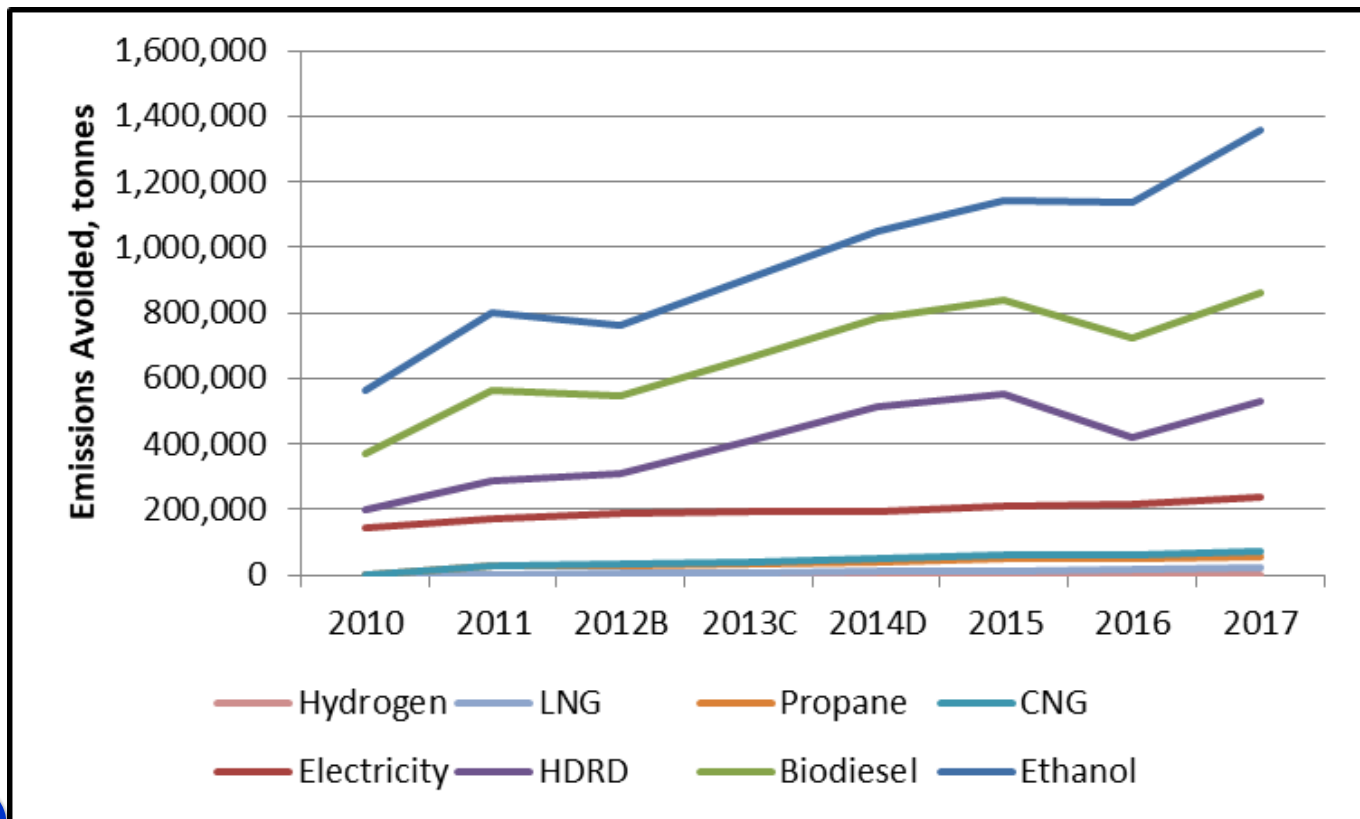
California Experience



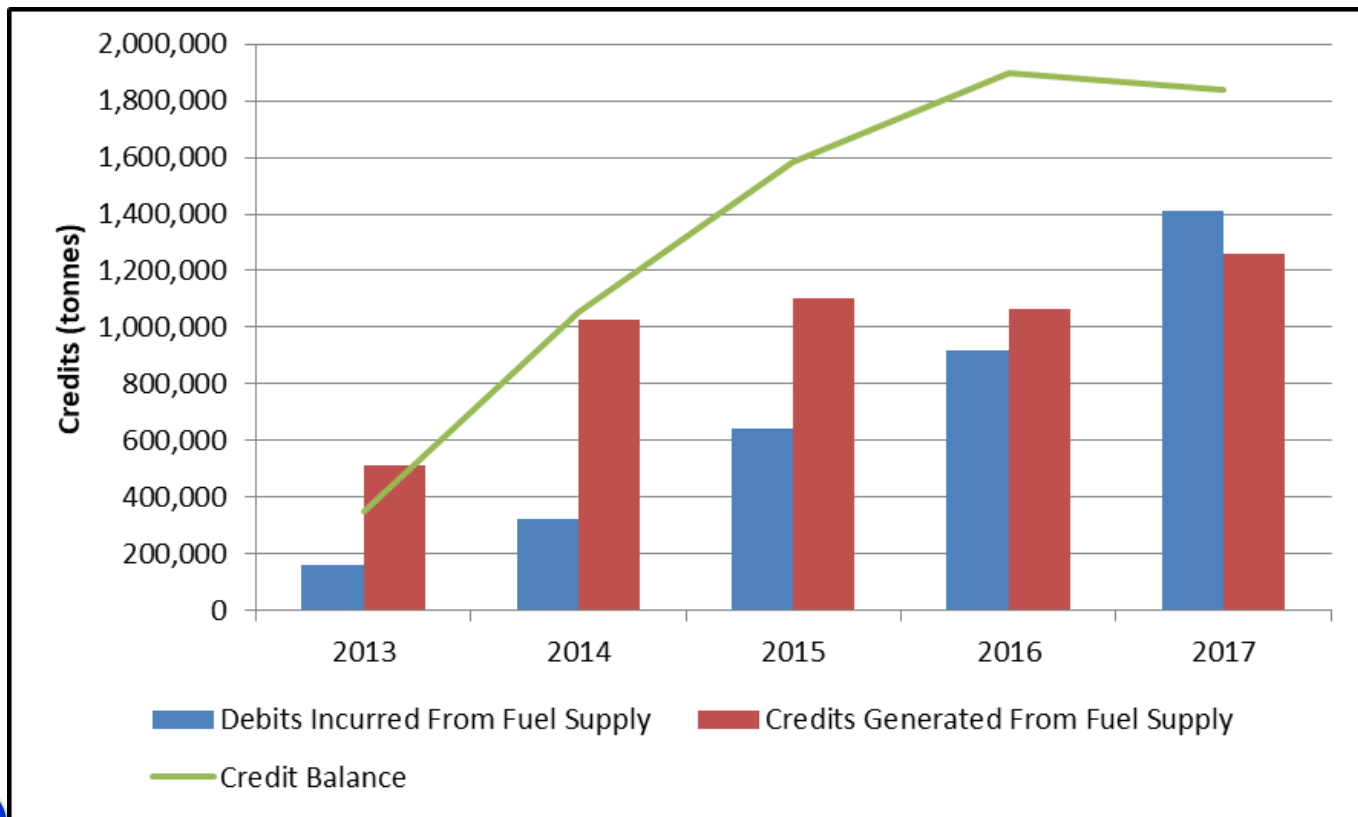
BC Experience



BC Experience



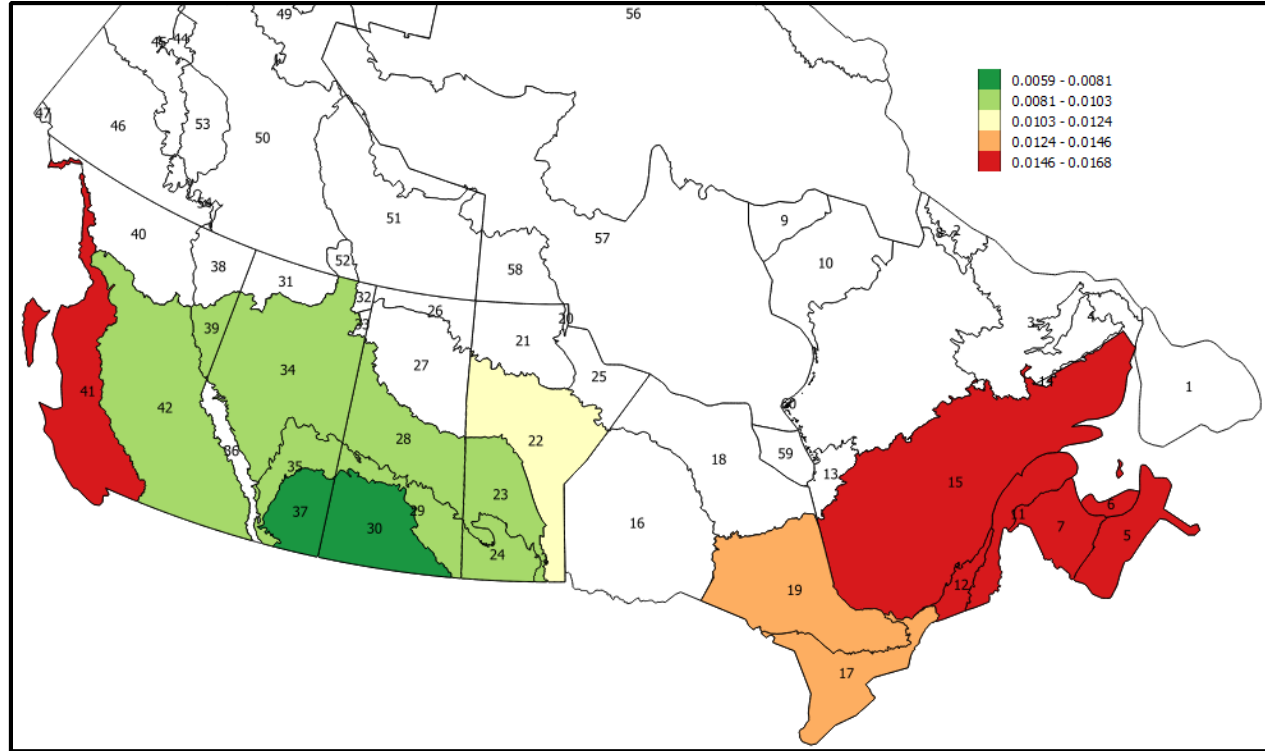
BC Experience



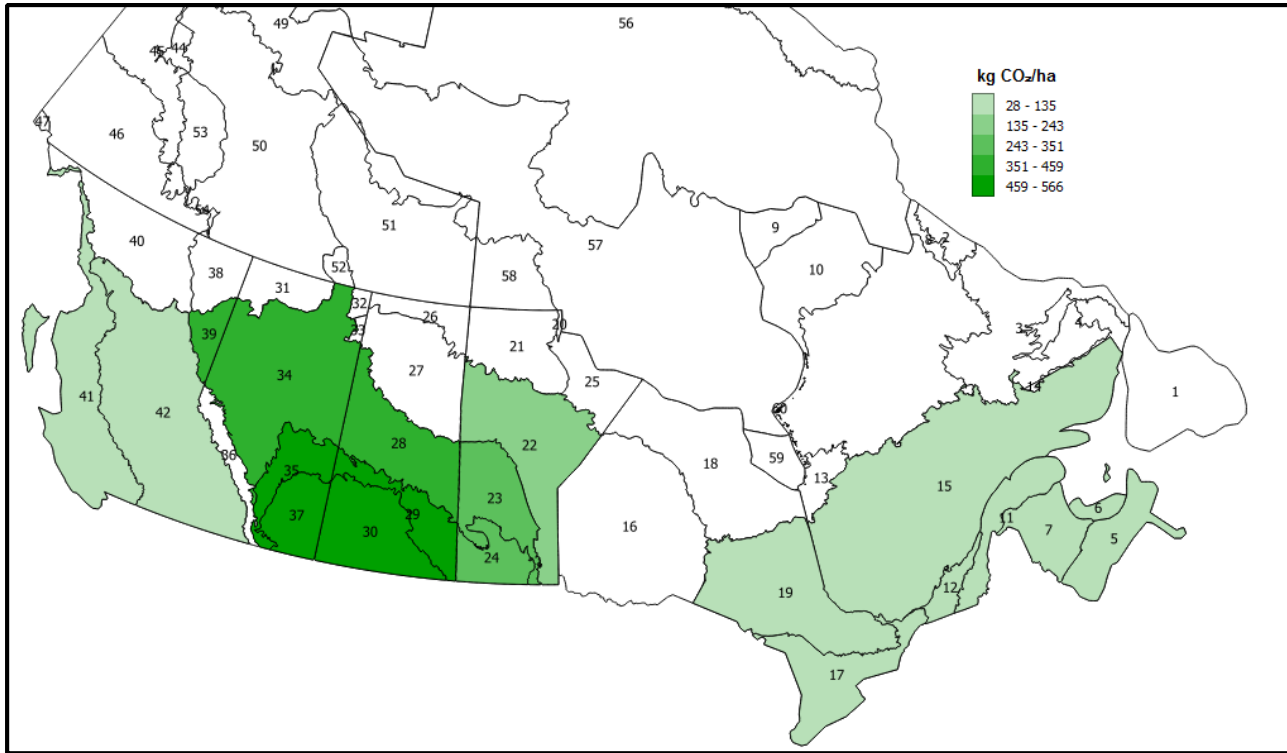
Prairie Advantage

- Feedstock related emissions for Prairie crops are among the lowest in the world.
- The driving factors are
 - Low precipitation leads to lower N₂O emissions from the decomposition of N fertilizers and crop residues.
 - Increase in soil carbon from reduced fallow frequency and the adoption of reduced and no tillage production systems.

Prairie Advantage N₂O Emissions



Prairie Advantage Soil Carbon



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Challenges Moving Forward

- Will the CFS result in increased demand for biofuels and increased demand for prairie crops?
- The CFS is proposing a lot more compliance options.
 - ECCC has suggested that up to half of the emission reductions might come from emission reductions in the fossil stream and they have probably under estimated the CCS potential.
 - Emission Reduction Fund doesn't exist in California and BC programs.
 - They will also allow some credit trading between streams.

Challenges Moving Forward

- What will the LCA tool look like?
- When I introduced the concept of Land Management Changes at possibly the last stakeholder meeting before CG1 last week, ECCC gave no indication that they even knew what that was.
 - California does not allow LMC in their tool. CCC spend a lot of effort trying to convince California to include that to no avail.
 - LMC is included in the LCA tool that BC, Ontario, and Alberta use in their renewable fuel programs.

Challenges Moving Forward

- ECCC has proposed following the EU sustainability requirements to avoid deforestation even though those requirements have done nothing to reduce deforestation because they encourage feedstock shuffling, good feedstock to biofuels and bad feedstock to food.
- The EU has now proposed new requirements to ban palm oil as a feedstock because the old requirements didn't stop palm expansion.
 - If the LCA for palm had been done properly in the first place, like it is done in BC and Ontario, palm wouldn't be a low carbon feedstock.

Challenges Moving Forward

- There has been very little discussion about the shape of the compliance curve. This is a critical issue. BC and CARB backed their curves and have regretted that decision.
- It was too easy to build a credit bank and that delayed obligated parties from making investment decisions so CARB reduced their requirements for 2019 and 2020 and BC is expecting that some obligated parties will be paying \$200/tonne for their shortfalls in 2019 and 2020.
- It shouldn't be enough that a program works just in 2030 and then fails miserably in 2031. the shape of the compliance curve is the second most important critical success factor after the LCA tool.

Conclusions

- The CFS standard offers the potential for significant increases in biofuel demand in Canada if the obligated parties respond in the same way that they have in BC and California.
- The GHG emission reductions are larger than BC and California projected in their first ten years and ECCC wants to see this change happen in eight years.

Conclusions

- As with any complicated regulation, the devil is in the details and we won't know all of the details until sometime in 2020 with the current schedule.
- Neither BC nor California got their programs right in the beginning. Both had to pause their programs and re-launch them.
- The current CFS proposals are much more complicated than those two existing programs.

Questions?

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