

Dear Air Resources Board,

I have some brief comments in relation to the proposals for additional credit generation options under LCFS suggested at the meeting of 14-15 October, in particular regarding the potential of each to further the goals of the program.

The first proposal presented (by Norsepower) was to allow crediting for the use of mechanical sails for oil tankers. Provided that measurement of delivered fuel savings can be satisfactorily achieved, I believe that this technology appears on first inspection to be a good candidate for crediting under LCFS. As noted in the presentation, currently there is a lack of strong regulatory incentives to deliver projects of this type despite offering a technology compatible with long-term decarbonisation goals. If the LCFS was able to catalyse the introduction of mechanical sails to a wider fleet, this could deliver additional indirect emissions savings on the assumption that ships fitted with this technology will also be used on other routes.

The second proposal, from M-RETS, relates to the introduction of a proprietary system for tracking and transacting certificates for renewable thermal resources. I am not familiar with the system described and therefore am unable to make any judgement on any advantage its use would present as compared to existing systems.

The third proposal, from Farmer's Business Network, seeks to allow crediting of biofuel feedstock production where it achieves a lower carbon intensity than the current GREET-based default values. The premise of this crediting is consistent with the LCFS-concept, giving credit for producers with lower carbon intensities, however I would encourage the ARB to be cautious when considering expanding crediting opportunities in this space. One logical response to the introduction of crediting of lower carbon intensity feedstock production would be for ethanol/biodiesel from feedstock grown at lower carbon intensity to be preferentially selected for supply to California (as in the past biofuel production facilities with lower carbon intensities have sought preferentially to supply the California market). In the first instance, such 'cherry picking' of the best performing material for supply to California would deliver no net GHG systems for U.S. agriculture as a whole, but given the variability in agricultural conditions across farms (as illustrated in the presentation by FBN) could deliver a large number of credits into the LCFS program. Such a large injection of credits could materially affect credit prices, negatively affecting existing good faith investments in technologies that may have greater potential to deliver net GHG reduction. A shock of this sort to the reliability of the LCFS value proposition would be regrettable given that it has taken some time for the LCFS to develop its reputation as a basis for investment. There may be mitigating measures that ARB could consider to allow increased disaggregation of carbon intensity values for feedstock farming while softening the impact to the system from cherry picking/shuffling credits. One option would be to increase options for crediting of specific actions taken to actively reduce carbon intensities for specific farms. Another might be to only partially credit reporting of lower carbon intensity feedstock production in the first instance, perhaps allowing a period of some years before exposing the feedstock production market to the full LCFS value signal (e.g. crediting only a quarter of the reportable carbon intensity benefit in the first year that additional crediting options were introduced). A gradual introduction of such measures would also give ARB the opportunity to consider strengthening of LCFS targets to compensate for the introduction of cherry picking/shuffling credits, and to preserve the underlying strength of the credit market. While the risk of creating an undesirable market shock by rapid introduction of such

crediting is considerable, I think that it can be recognised that once the initial process of market shuffling is over there would be some potential for real GHG savings to be delivered in the agricultural sector, and thus it would be appropriate for ARB to continue to assess options to create stronger incentives for farmers to adopt lower-carbon practices.

In the fourth presentation Oxy have proposed a system to allow frontloading of credit for the operation of direct air CO<sub>2</sub> capture. Under this proposal four years of credits would be made available on financial closure, and would be 'paid back' by the facility under operation. While DAC is an important long-term technology, it is not entirely clear from the PDF of the presentation what the link is to the transport energy markets covered by LCFS. If ARB considers frontloading credit award to such projects it would be appropriate to also consider whether credit frontloading could be utilised to support commercialisation of other high-investment-cost technologies. ARB should recognise that it is not possible to guarantee that facilities offered front-loaded crediting will be successful and therefore that some emissions reductions may never be realised, and should consider the impact on credit markets of bringing credit award several years forward.

One suggestion for further credit frontloading is provided in the sixth presentation, by Virent, although this proposal asks for strictly additional credits rather than for credits that will be paid back by an operational plant. I am supportive in principle of measures to accelerate deployment of technologies of the type described, and in particular of measures to give investment certainty for advanced technology cellulosic fuel production. As noted in regard to other suggestions, ARB should give consideration to the impact on the market of injecting additional credits. Investment credits for such projects would not be generated at the same level as cherry picking/shuffling credits under the FBN proposal, but could still affect credit values. It would be a great irony if the introduction of an investment credit program undermined investments by devaluing compliance credits. ARB should also carefully consider the extent to which it is comfortable to add additional investment credits to the system that are not associated directly with emissions reductions.

The final presentation seeks credit for an oil extraction technology proposed as a lower carbon alternative to steam enhanced oil recovery. I am not familiar with this technology and therefore can only say that in cases where it can be demonstrated that it avoids the use of thermal extraction methods it would be reasonable for it to be given comparable treatment to other lower carbon alternatives to steam enhanced oil recovery.

Yours,

Chris Malins,

Cerulogy