



## Agriculture, Forestry, and Waste Management Technical Work Group

### Assessment of Cumulative Impacts

In addition to estimating the impacts of each individual policy option considered by the Policy Work Group, we have estimated the *combined* impacts of all of the policies in each sector if all were implemented together. This involves eliminating any overlaps in coverage that would occur to avoid double-counting of impacts. We have also evaluated and quantified any overlaps between the AFW sectors and the other sectors to establish an assessment of the cumulative impacts of all policy options in these two sectors.

The methodology applied to perform these assessments is as follows:

#### *AFW Overlap Considerations*

AFW-1, 3, 4, & 5: These options present the potential for interaction, should the CAP adopt each of these policy options. AFW-4 & 5 quantify the reductions associated with increased in-state production of biofuels. Depending on the development of biofuel feedstocks in Colorado, these options may necessitate an increase in agricultural output. This increase in output may have an impact on the GHG reduction potential of AFW 1 (which reduces the amount of land cultivated under conventional tillage and increases the efficiency of nitrogen fertilizer applications) and AFW 3 (which reduces the on-farm energy consumption in CO). However, these interactions were not considered in the cumulative quantification of the AFW options, as such a task would require a significant number of assumptions and projections that may not be justifiable.

AFW 9 & 10: A PWG member raised the concern that the significant diversion of waste from landfills – as proposed by AFW-9 – would eventually lead to a decrease in the volume of waste in landfills in CO, and therefore a decrease in the quantity of methane emitted. However, as waste that is deposited in landfills emits methane over a long period of time, the impacts of the diversion proposed by AFW-9 on landfill methane generation are not expected to be significant over the course of the policy period. Therefore, the interaction between the two options is deemed to not be significant enough to warrant counting for overlap in the cumulative analysis.

#### *Inter-PWG Overlap Considerations*

AFW-2: Manure Management & Energy Utilization: all energy produced assumed to be used on-farm, so there should be no overlap with ES-1 & 2 renewables options.

AFW-3: Reductions in On-Farm Energy Use: these are farm-specific energy reduction programs, so we are unaware of any overlap with RCI energy efficiency options.

AFW-4 & 5: Biodiesel and Ethanol Production Options: as described in the AFW POD, we quantified the reductions as those felt to be incremental to the TLU-5 low carbon fuel standard (LCFS). These incremental reductions are based on two important assumptions: 1. for ethanol used to supply the LCFS within the policy period, the assumed source is starch-based ethanol (incremental reductions are associated with in-state production of cellulosic ethanol). 2. for biodiesel used to supply the LCFS within the policy period: we assume that the predominant feedstock source is soybean oil (again incremental reductions are based on producing feedstocks with higher GHG benefits).

The way that the reductions were quantified means that there is no overlap that required adjustment.

AFW 7 & 8: Forest Health and Biomass Feedstocks for Energy Production: the biomass generated with this option is assumed to be consumed within the RCI sector (e.g. residential or municipal biomass heating). After checking in with the RCI facilitators, there appears to be no overlap with the RCI options.

AFW-10: Landfill Methane Reduction Programs: there are two components of the benefits calculation – 1. GHG reductions via control of methane emissions from landfills; 2. GHG reductions via utilization of the methane collected to offset fossil fuel use. GHG reductions from the second component were left out of the cumulative totals, since there is overlap with the ES-2 RPS option.