

Sustainable alternative jet fuels and CORSIA: Getting the incentives right

Prof. Dr. Robert Malina

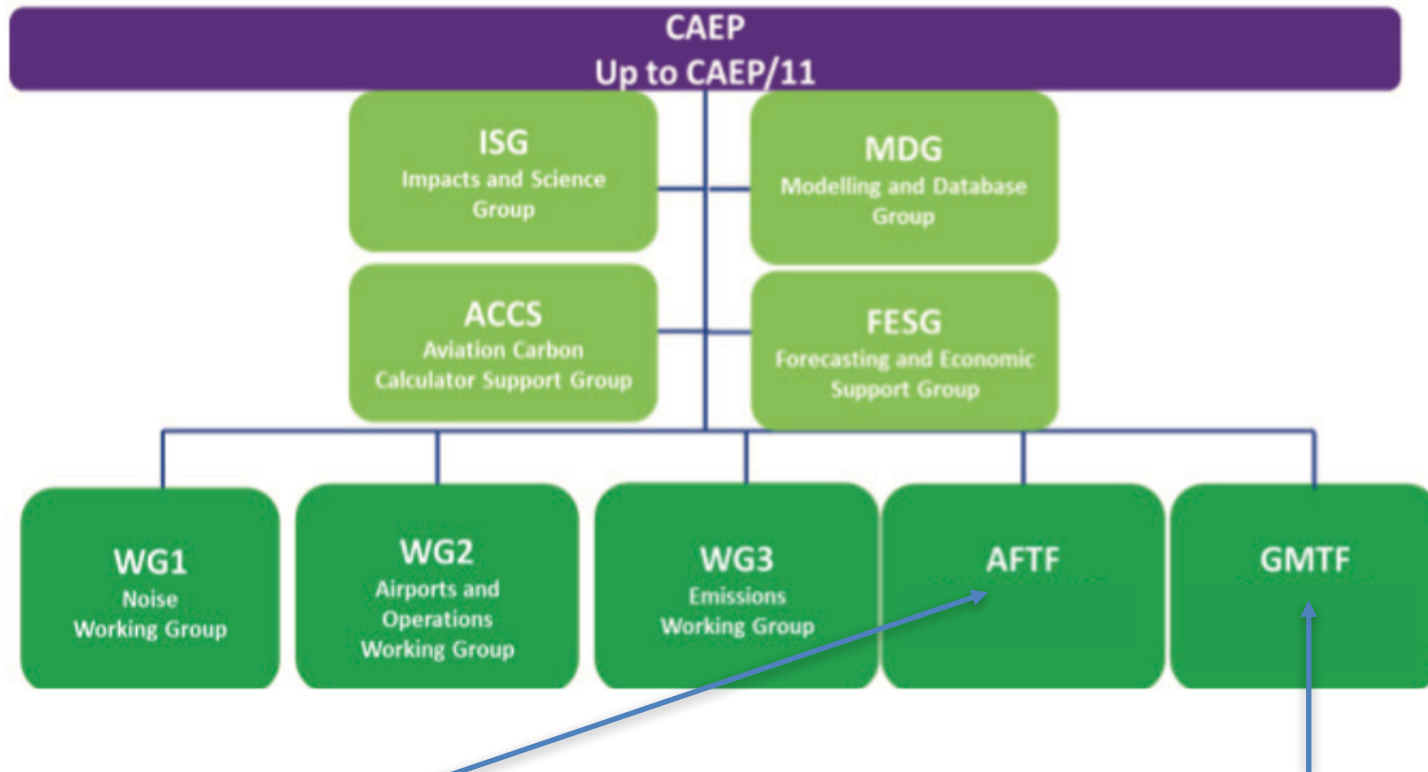
AIREG Meeting
Berlin, Germany – November 23 2016



CORSIA

- From 2021, airlines will have to buy carbon offsets for CO₂ emissions beyond average emissions p.a. in 2019 and 2020
- Offsets can be bought from the open market – offset eligibility criteria will be developed
- Voluntary participation by States until 2026, followed by mandatory participation (with exceptions) from 2027 to 2035
- Use of sustainable alternative aviation fuels reduces the offsetting requirements of airlines

ICAO groups working on CORSIA



Alternative Fuels Task Force (AFTF)

Develops method for inclusion of alternative jet fuels in CORSIA

Global Market-Based Measure Technical Task Force (GMTF)

Develops the overarching CORSIA method

Eligibility requirements for alternative jet fuels

Meet Sustainability requirements

Currently being developed for AJF in general

AFTF Sustainability Task Group
(Leads: Thomas Roetger /IATA, Pedro Piris-Capezas/ICSA)

Provide GHG emissions benefit on a lifecycle basis compared to conventional petroleum

Currently being developed for specific feedstock/conversion pathway combinations

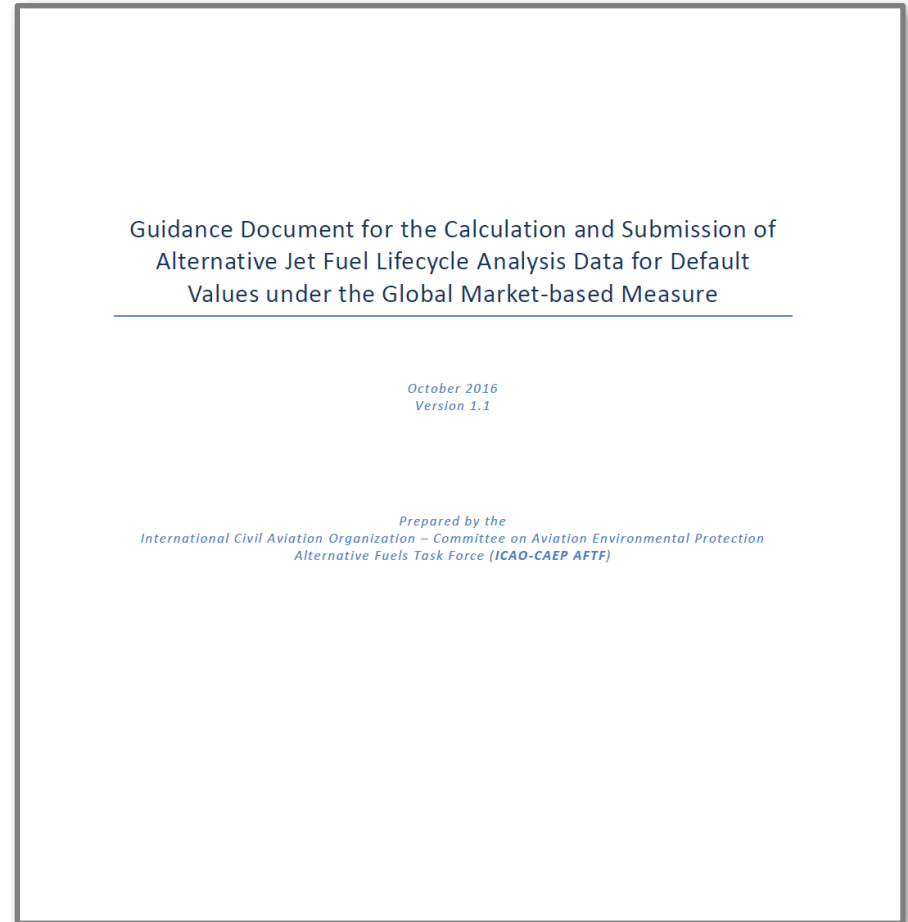
AFTF Core LCA Task Group
(Leads: Maria de la Rica Jimenez / SENASA, Robert Malina / U Hasselt)

AFTF Land Use Change Task Group
(Leads: Wally Tyner / Purdue U, Brad Saville/U Toronto)

Method for calculation of lifecycle emission values

LCA method developed by AFTF covers the following aspects:

- Pathway Scope
 - System boundary
 - Emissions species of interest & functional units
 - Co-product allocation
 - Intended use & fossil fuel baseline
- Method summarized in a guidance document that can be shared with interested parties

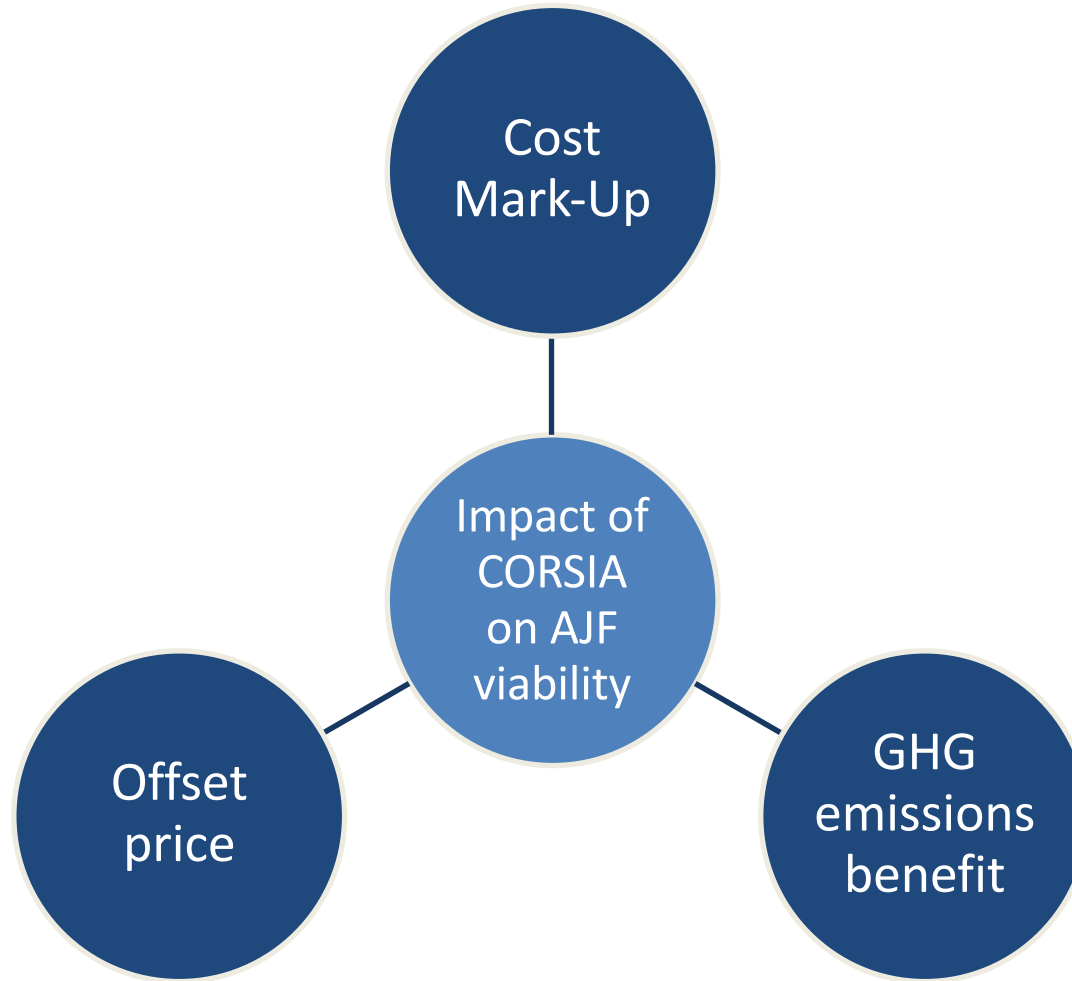


Core LCA Data request

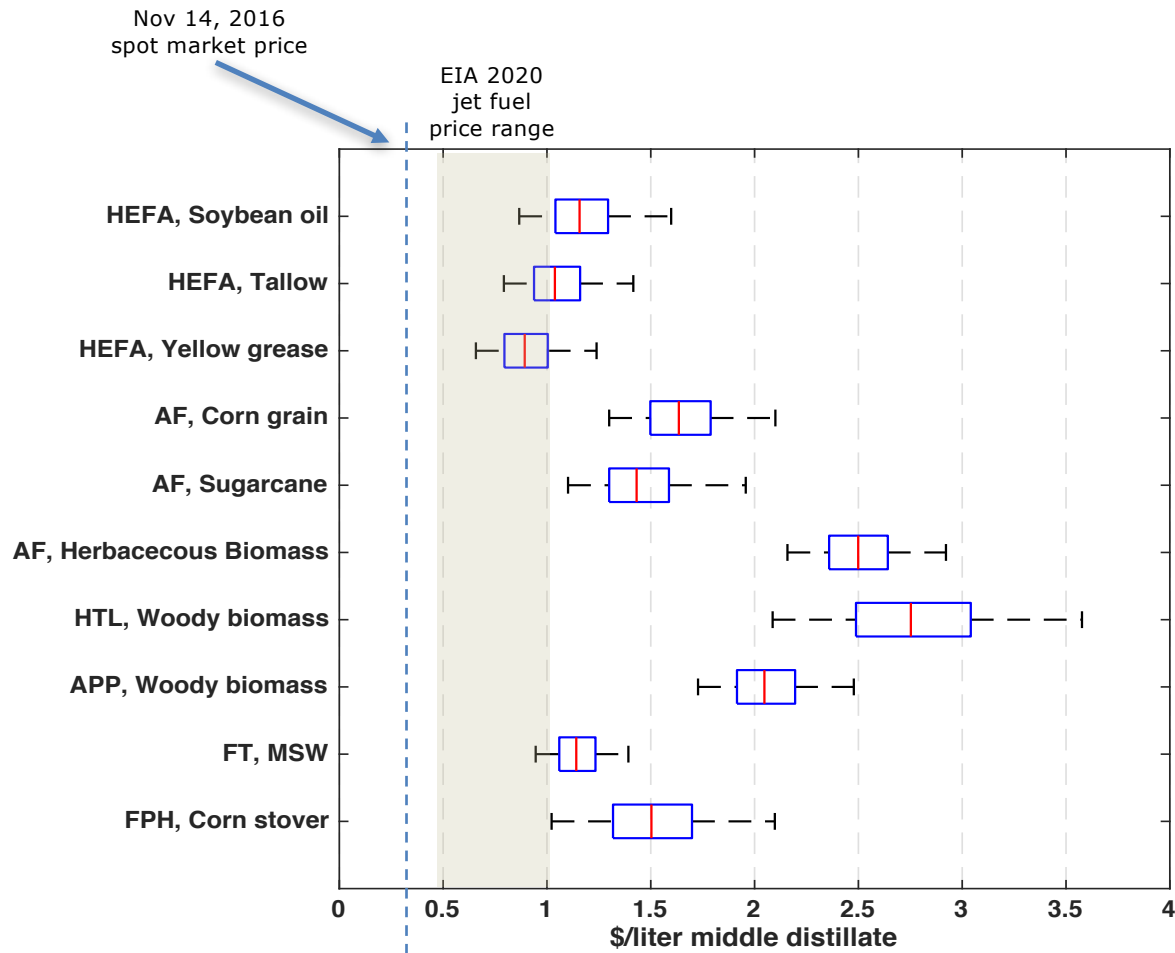
- AJF pathways will be assigned default LCA values under CORSIA
- LCA studies or values can be submitted to be considered for inclusion under CORSIA to aid this process. These must:
 - use the methodology described
 - use FT, HEFA, SIP/DSHC, or iBuOH-to-jet, ASTM certified conversion technology
 - be transparent and replicable
- Requirements for LCA studies or values submitted are outlined in a “Guidance Document”, to be circulated via email
- Data can be submitted to Core LCA TG Co-Leads:
 - Prof. Robert Malina - robert.malina@uhasselt.be
 - Ms. María de la Rica Jiménez - mmrica@senasa.es
- Note that submission of data is for information purposes only, and does not constitute the discussion or decision-making process of AFTF.

What does CORSIA mean for the economic viability of alternative aviation fuels?

CORSIA impact on economic viability



The "no policy" costing perspective

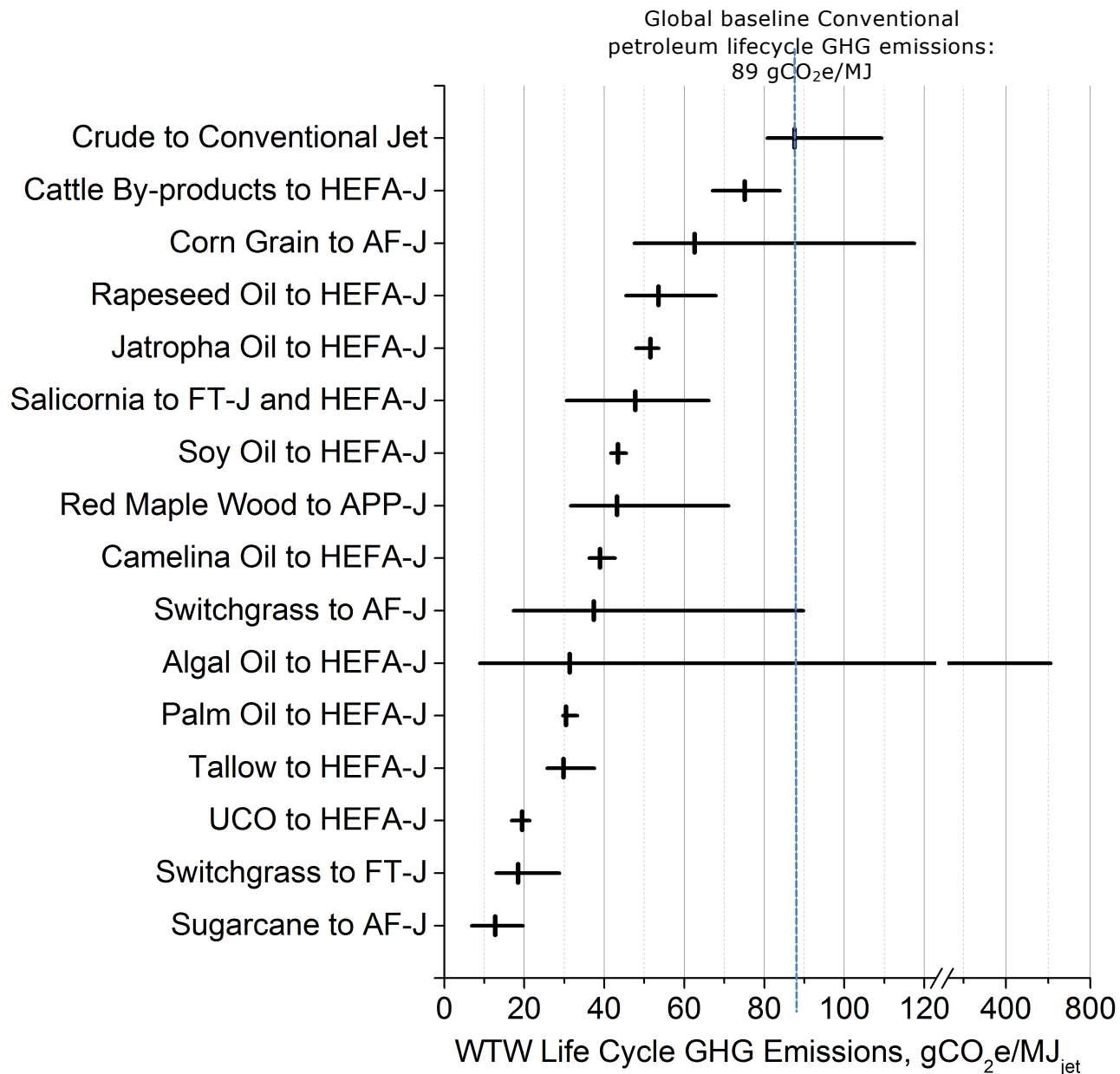


No RIN credits or other subsidies included.

Results from harmonized TEA assessment

Do not cite, as currently under peer-review.

The GHG emissions perspective

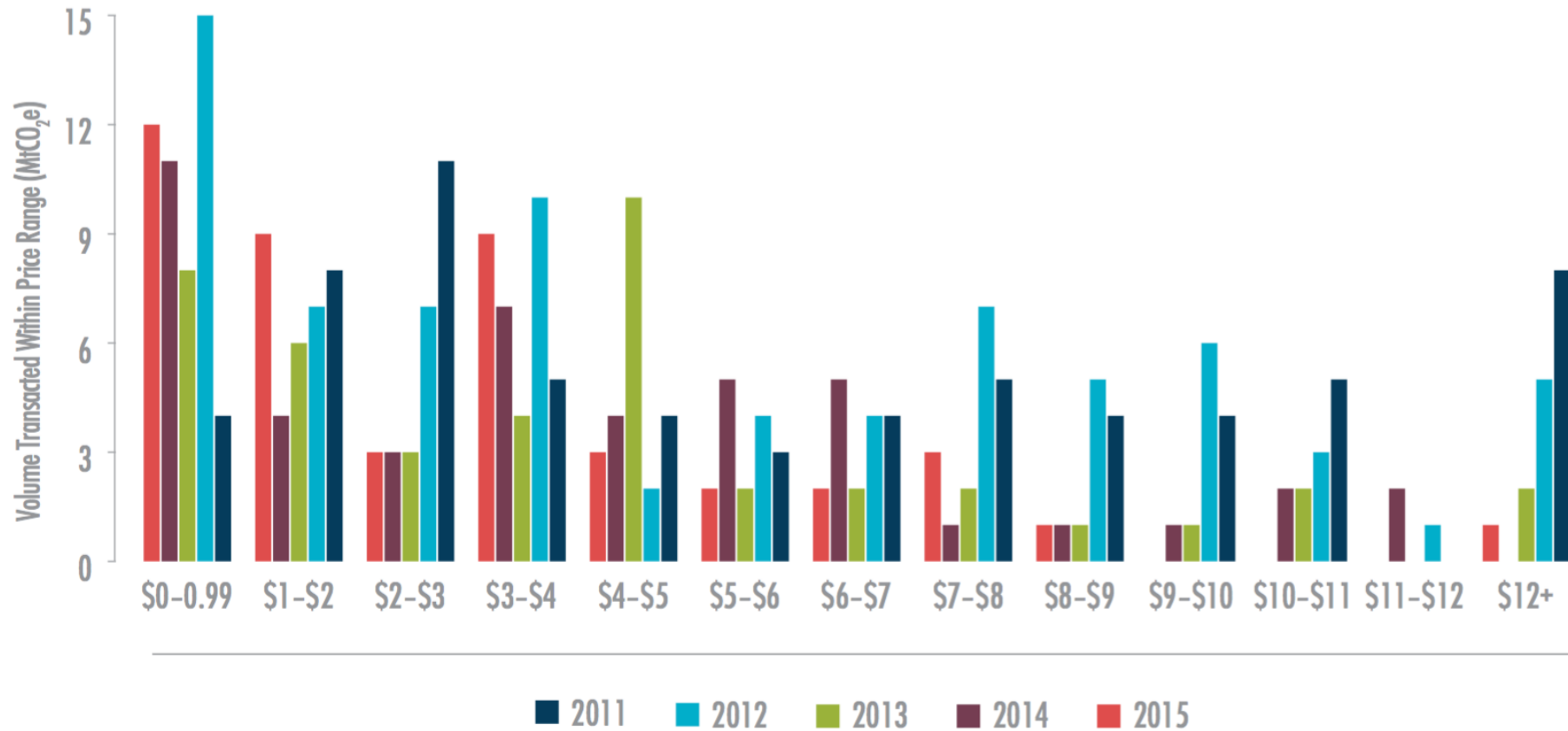


Results from Stratton et. al. (2011), Carter (2012), Staples et al. (2014), Seber et al. (2014), Bond et al. (2014) and on-going work. All data peer-reviewed with exception of APP results. Results shown for production scenarios without land-use change

Offset prices

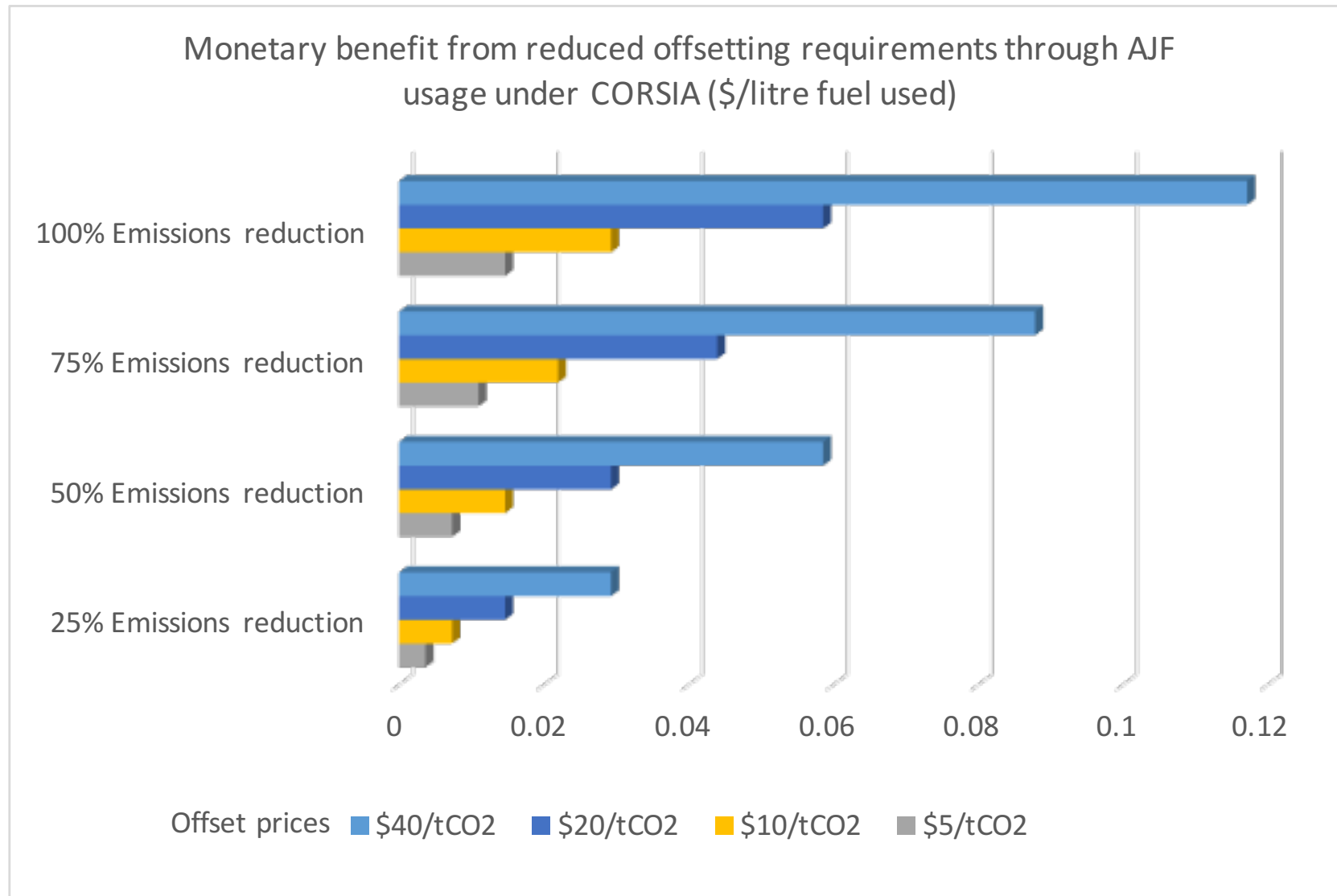


Figure 3: Transaction Volume by Average Price, 2011–2015

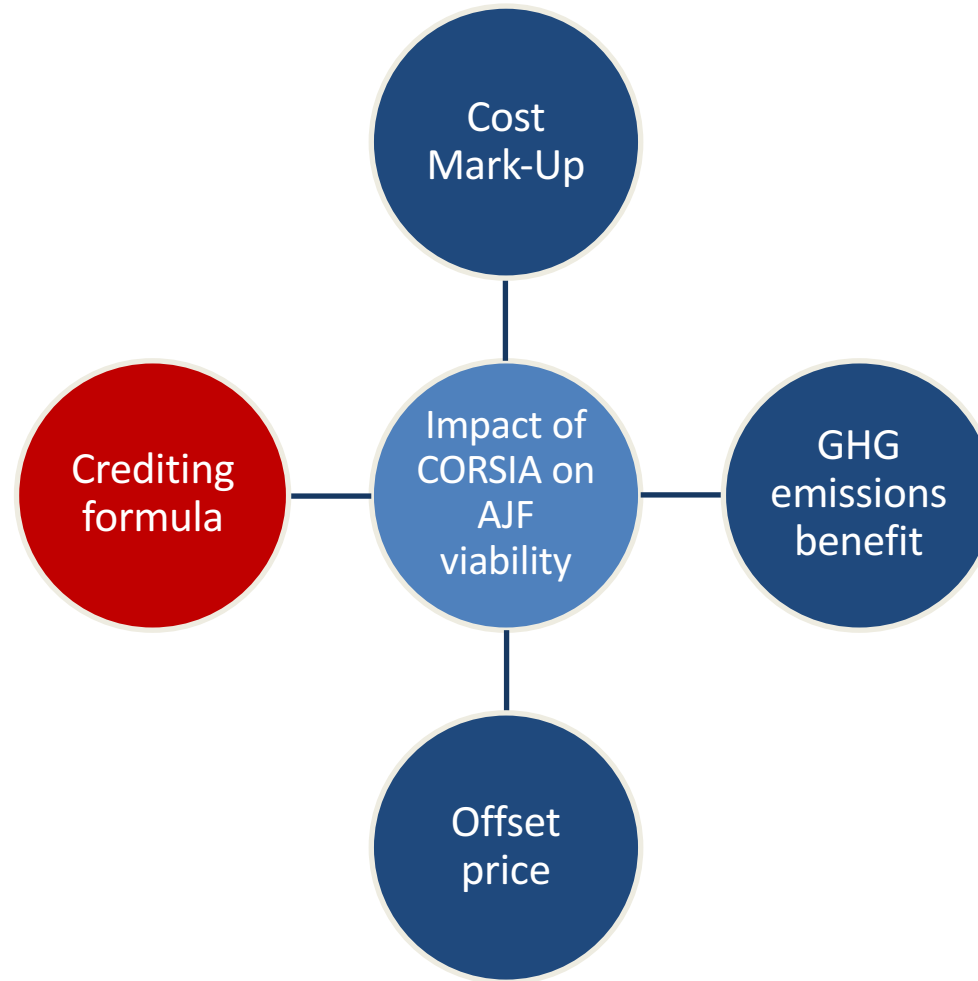


Source: Ecosystem Marketplace: Raising Ambition, State of the Voluntary Carbon Markets 2016

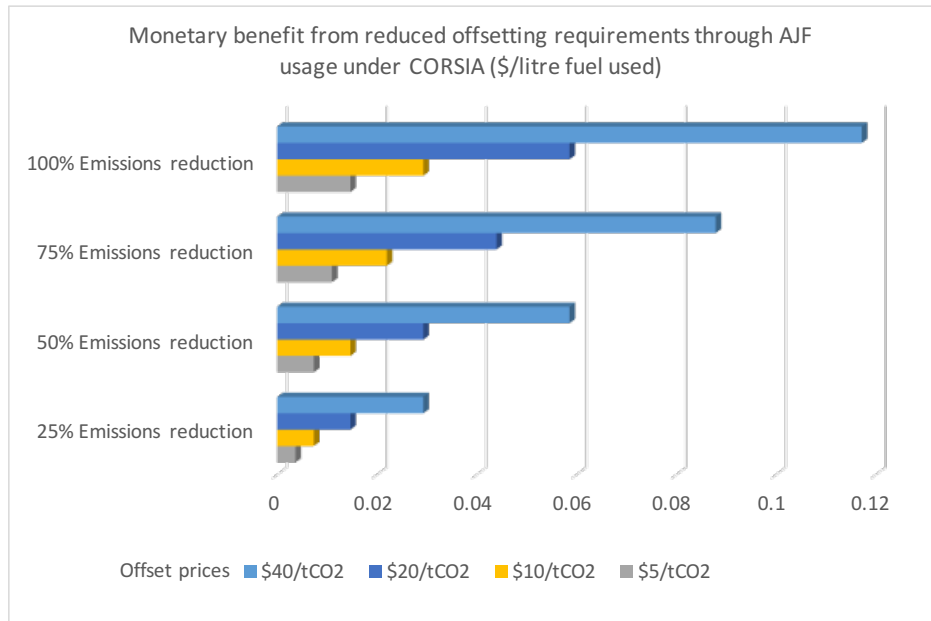
Putting this all together: Potential monetary benefit of AJF under CORSIA



Crediting formula as additional lever



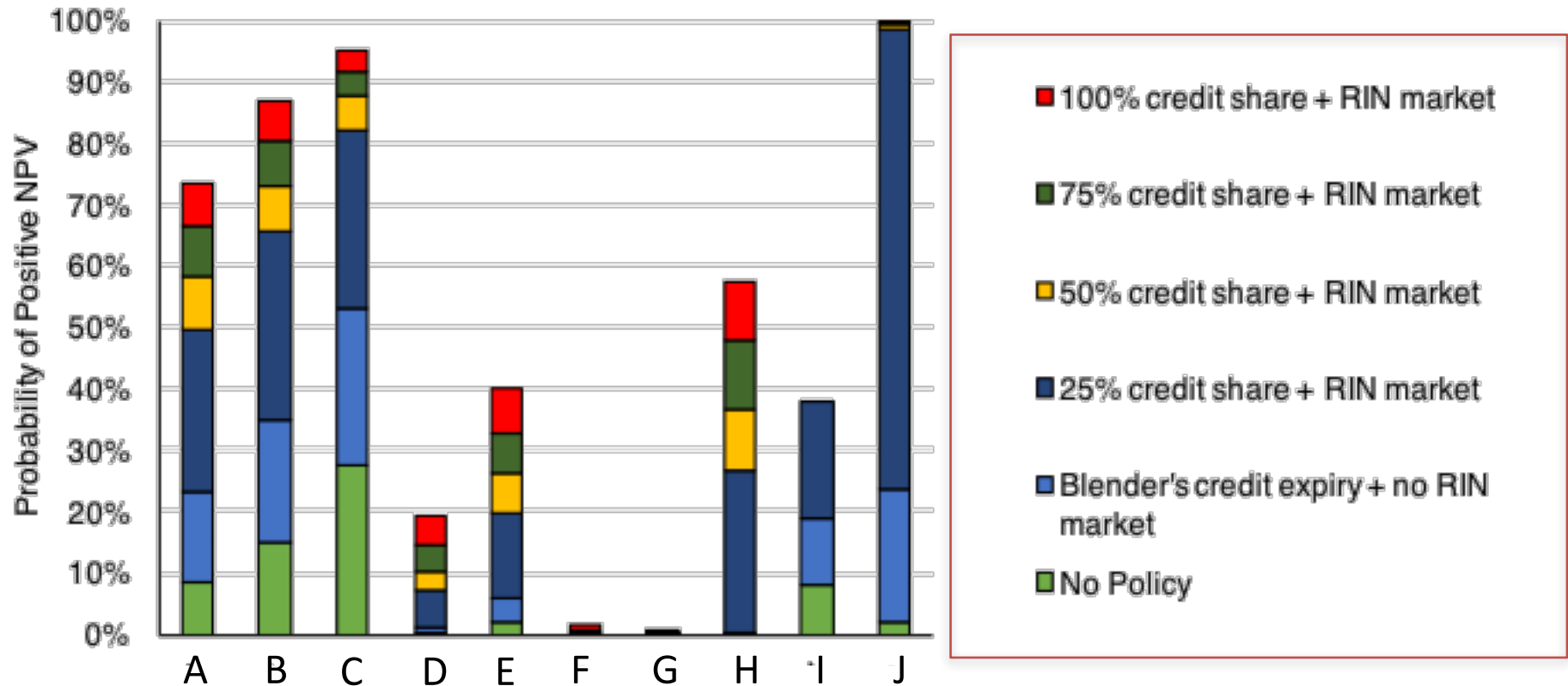
Crediting formula as additional lever



Assumes 1:1 conversion of emission benefit into reduction of CO₂ offsetting requirements

- Crediting formula not part of existing CORSIA agreement
- “Multipliers” for credits could increase the monetary benefit of using AJF

CORSIA as an add-on to existing policies



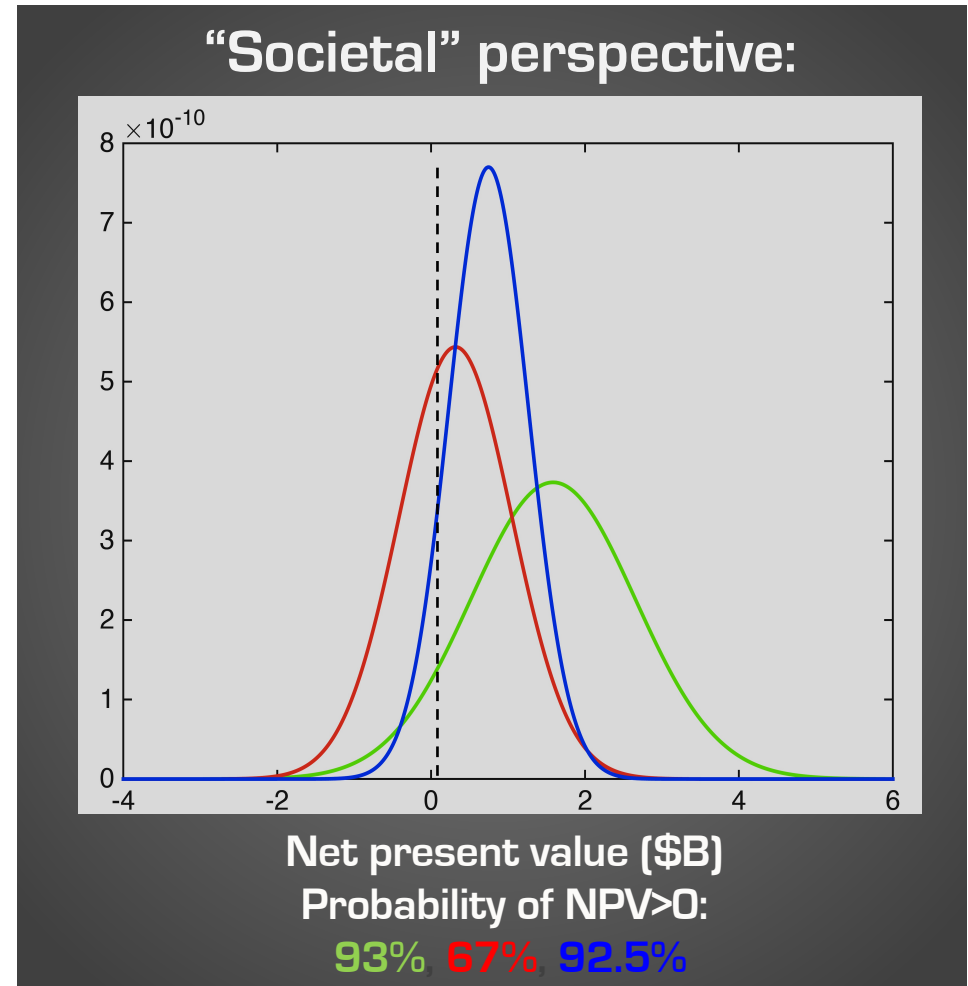
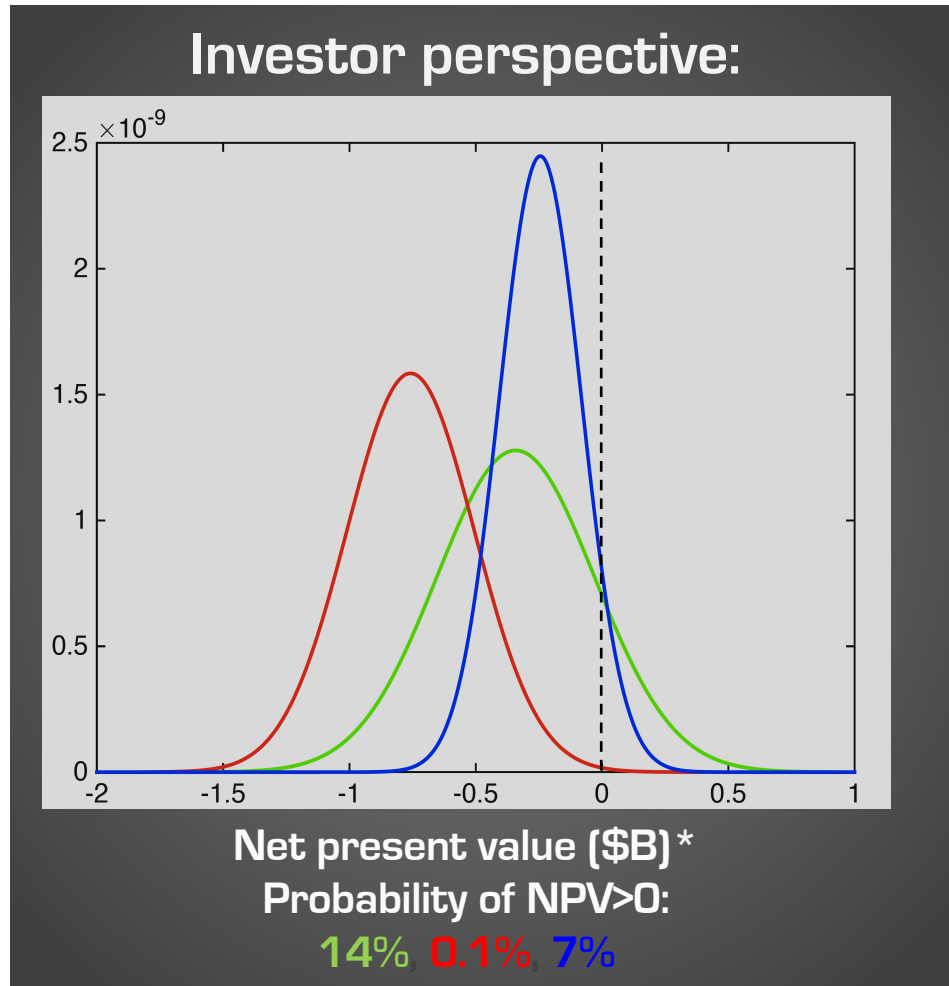
Pathway results anonymized.

Pre-Trump election analysis based on TEA for US

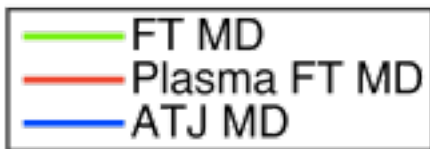


So is AJF worth the effort (by companies, researchers, governments)?

From investor to societal perspective: MSW to jet example



Results are specific to the assumptions below and cannot be generalized



*No RIN credits included

Assumptions used for societal case

- Costs of carbon based on US EPA social costs of carbon
- Societal costs of capital of 3.2%
- Taxes and subsidies excluded as they constitute transfers



**Thank you for your
attention!**

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