



Greenhouse Gas (GHG) Emissions Calculator

meo
CARBON SOLUTIONS

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Germany

General Data	Name of the processing unit		
	Name		
	Street, Number		
	Postal code, City		
	Contact person		
Production capacity			
Production capacity of the processing unit		metric tons (mt)/Year	
Time period of data input			
Initial date		mm/dd/Year	
Ending date		mm/dd/Year	
Input Unit	Production main product		Source
	Bioethanol		Audited Financials
	Production co-products		Source
			Further Emissions



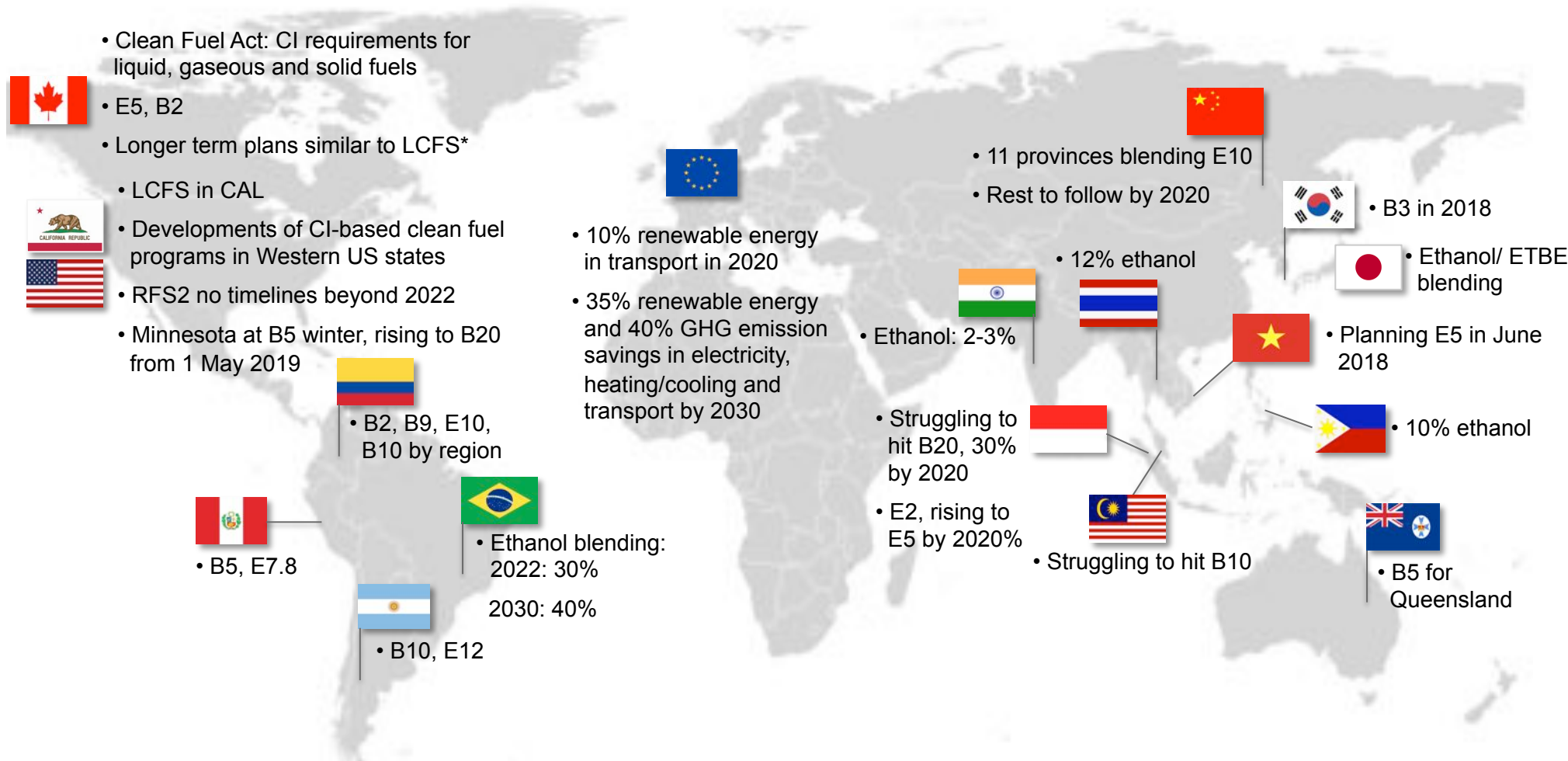
ISCC Sustainability Conference, Bogotá, March 06, 2018

Low Carbon Fuel Regulation in North America and the EU

Dr Jan Henke, ISCC System GmbH



Biofuel mandates on the rise – Supported by sustainability and GHG verification programs



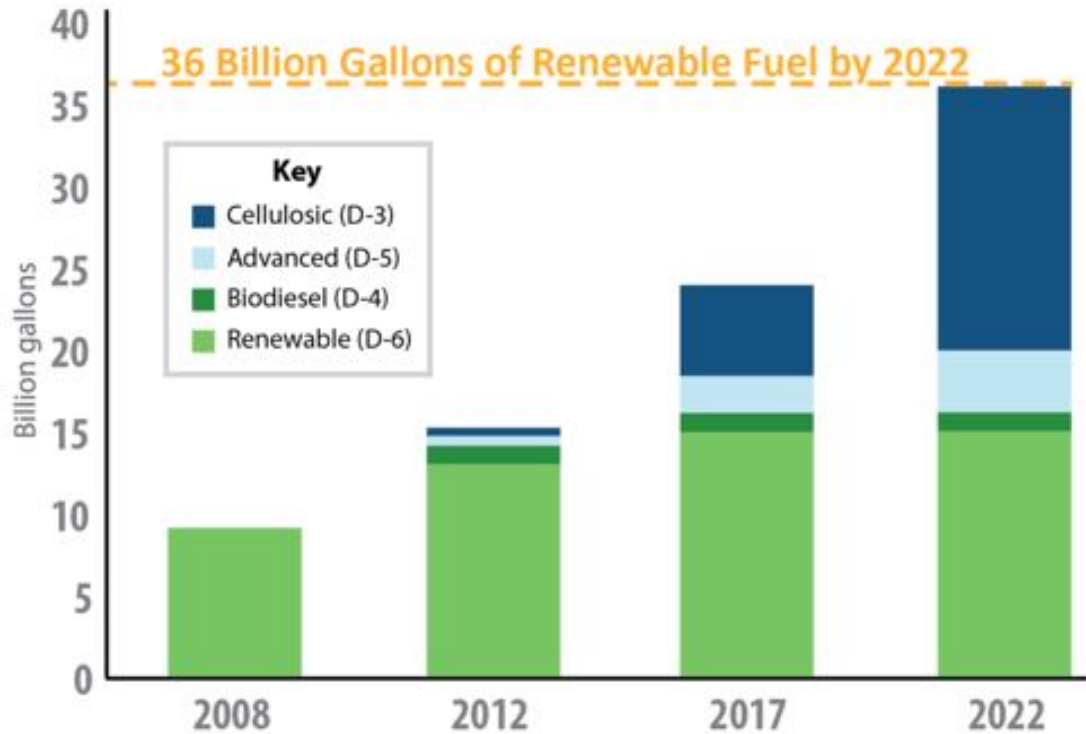
*Ontario: E5, blending B4 at 70% GHG threshold / BC: E5, B4 / Alberta: E5, B2 / Saskatchewan: E7.5, B2 / Quebec: planning E5 / Manitoba: E8.5, B2

Source: adopted, based on PRIMA and Meo Carbon Solutions

US – Overview of the Renewable Fuel Standard (RFS)



Congressional Volume Target for Renewable Fuel



- RFS is a national policy requiring **renewable fuel to replace fossil fuels**
- EISA (Energy Independence and Security Act of 2007) **increased size** of program and introduced **key changes**, :
 - 36 billion gallons of renewable fuel in 2022
 - extending yearly volume requirements through 2022
 - adding explicit definitions for renewable fuels to qualify (e.g., renewable biomass, GHG emissions)

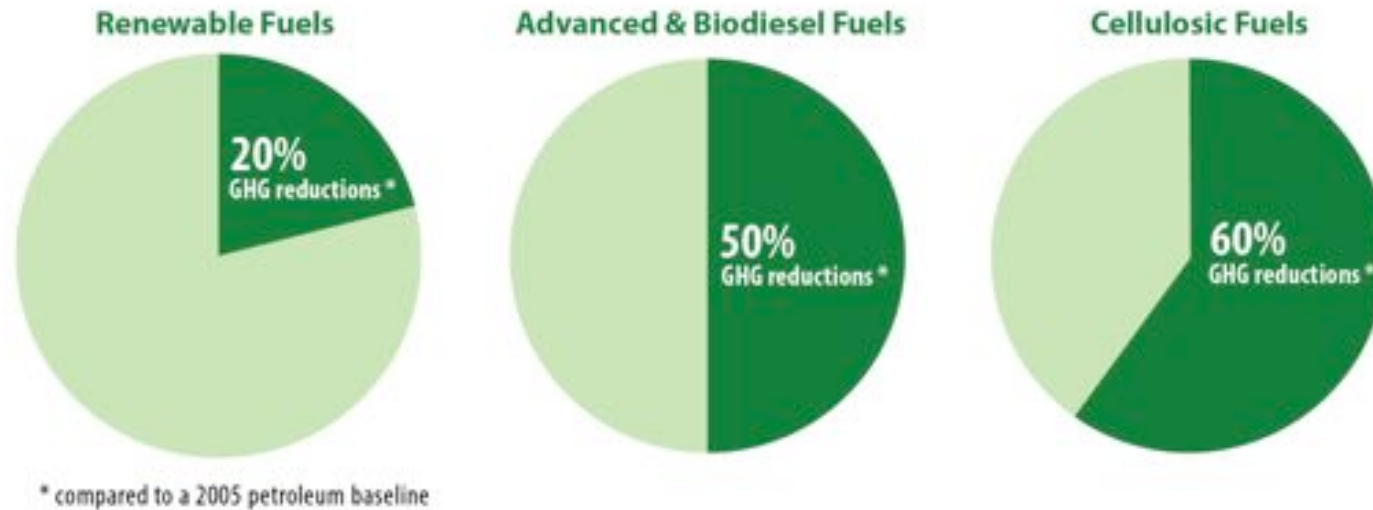
Source: <https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard>

GHG reduction targets for different types of renewable fuels in the US



Lifecycle Greenhouse Gas (GHG) Emissions

GHG emissions must take into account direct and significant indirect emissions, including land use change.



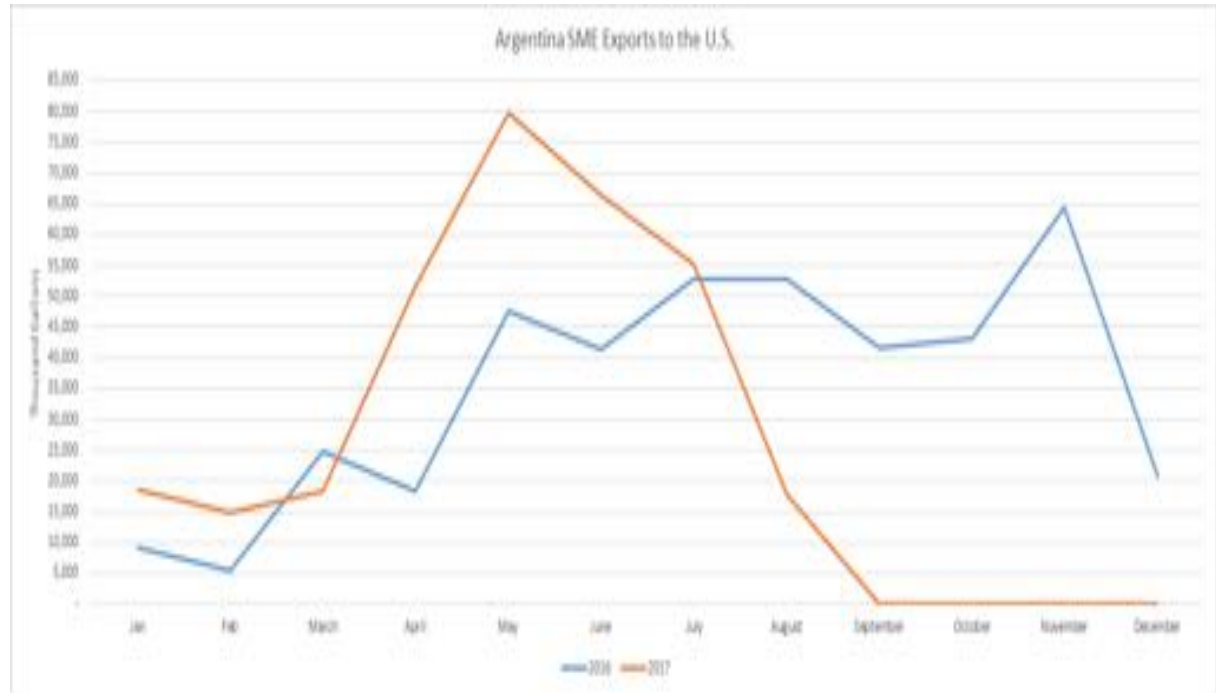
- Lifecycle GHG reduction comparisons are based on a **2005 petroleum baseline** as
- “**Grandfathering**” clause for biofuel facilities (domestic and foreign) that were producing fuel prior to enactment of EISA in 2007
- EPA continues to review and approve **new pathways**, including for fuels made with **advanced technologies** or with new **feedstocks**

Source: <https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard>

Development of RFS in the future – Insecurities for 2018



- **Anti-dumping** and countervailing duties on **Argentine and Indonesian** biodiesel imports
- The House and Senate passed 2-year **funding bill** on Feb 9th
 - **Biodiesel tax credit** included but only retroactive for 2017 and not applicable to 2018
- RVO (renewable volume obligations) known but obligated parties not feeling obligated
- 2019 Advanced RVO deadline is Nov 30th, 2018
 - EPA to **propose initial volumes** by July 2018



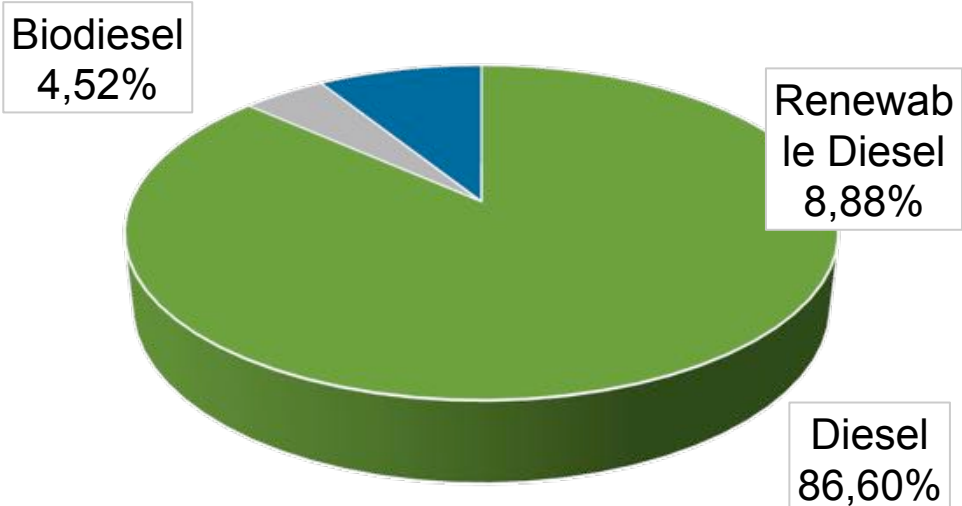
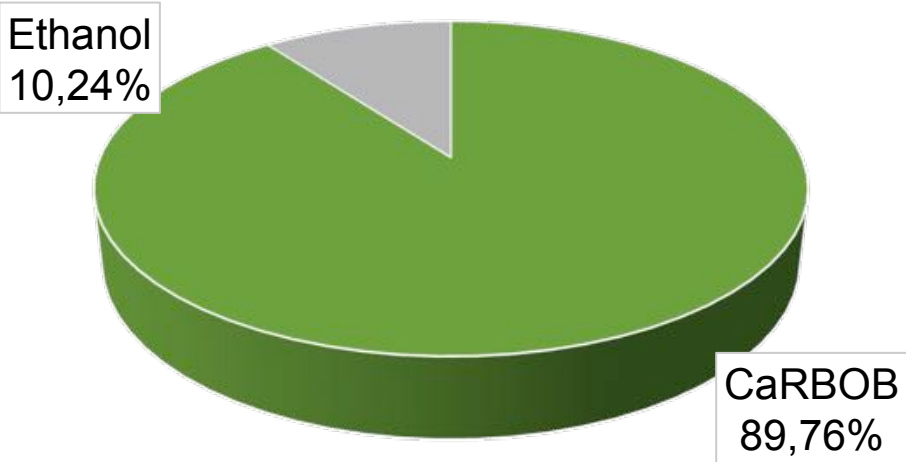
Source: Green Plains presentation, 8th ISCC Global Sustainability Conference

California is a forerunner in low carbon fuel policies



California gasoline (15.6 billion gallons)

California diesel (3.8 billion gallons)



■ CaRBOB ■ Ethanol ■ Diesel ■ Biodiesel ■ Renewable Diesel

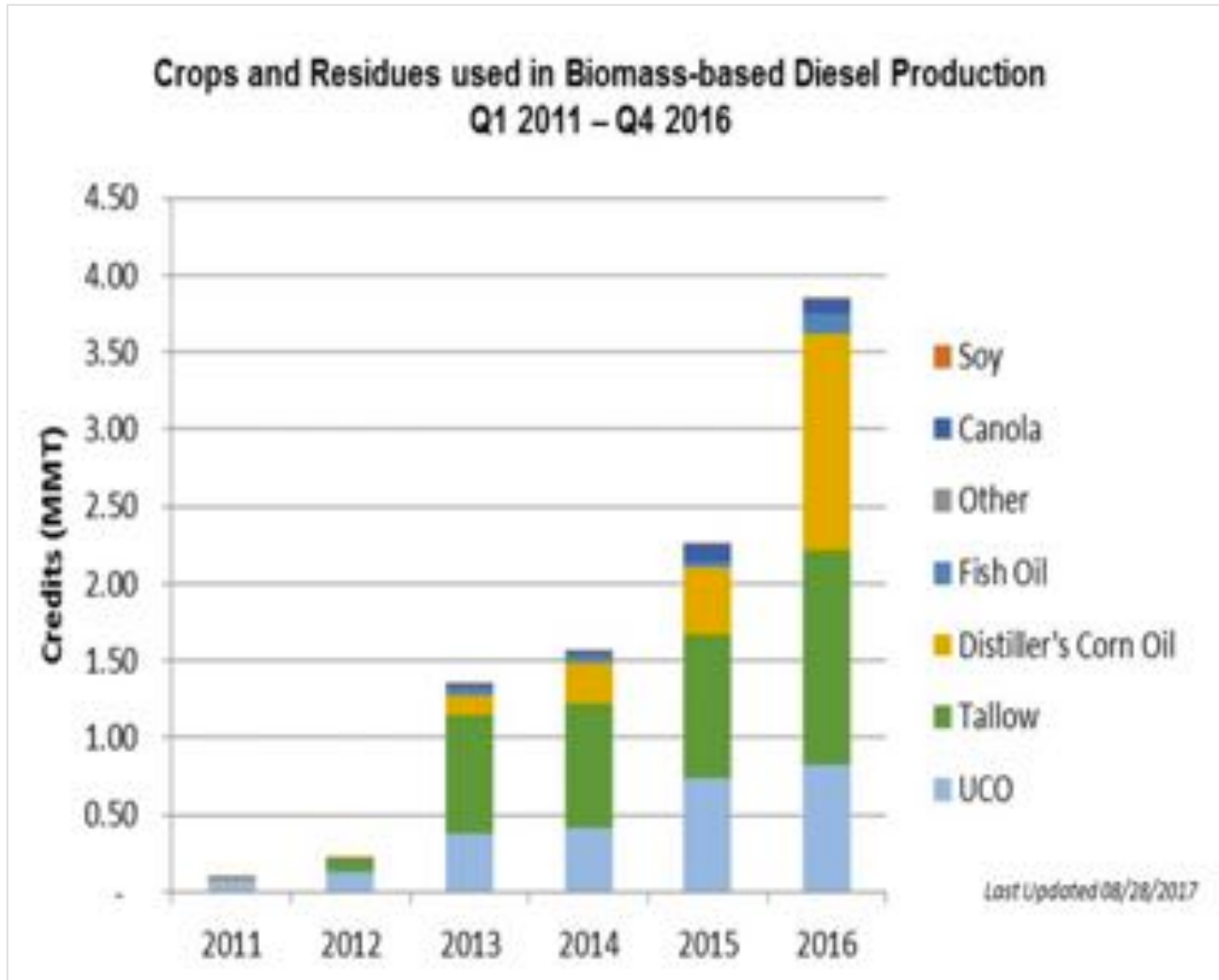
- California consumes **10% of the gasoline** consumed in the United States
- California consumes **7% of the diesel** fuel consumed in the United States

CaRBOB: California Reformulated Gasoline Blendstock for Oxygenate Blending

Source: www.arb.ca.gov



California has set with the LCFS (Low Carbon Fuel Standard) ambitious goals to reduce the carbon intensity of fuels



- LCFS incentivizes fuels derived from non-land based sources
- In 2016, 97% of credits generated came from waste or residues

Source: www.arb.ca.gov

CARB also aims for the use of independent certification systems – ISCC collaborates with CARB on this



Selection Criteria for Certification Systems

- Recognition by the European Union Renewable Energy Directive (EU RED)
- Multi-stakeholder process for vetting of additional requirements
- Transparency demonstration
- Auditor training program
- Oversight program
- Grievance mechanism
- Sanction mechanism for fuel production facility operators, imports, feedstock suppliers, and certification bodies
- Capabilities to perform full supply chain certification from point of origin to fuel production facility to importer
- Policies and mechanisms to monitor and prevent conflict of interest (COI) between members of the system, audited entities, and members of the certification bodies



The RED and FQD set the framework for the implementation of renewable energy regulations for the transport sector in the EU



Renewable Energy Directive (RED)

2009/28/EC from 2009

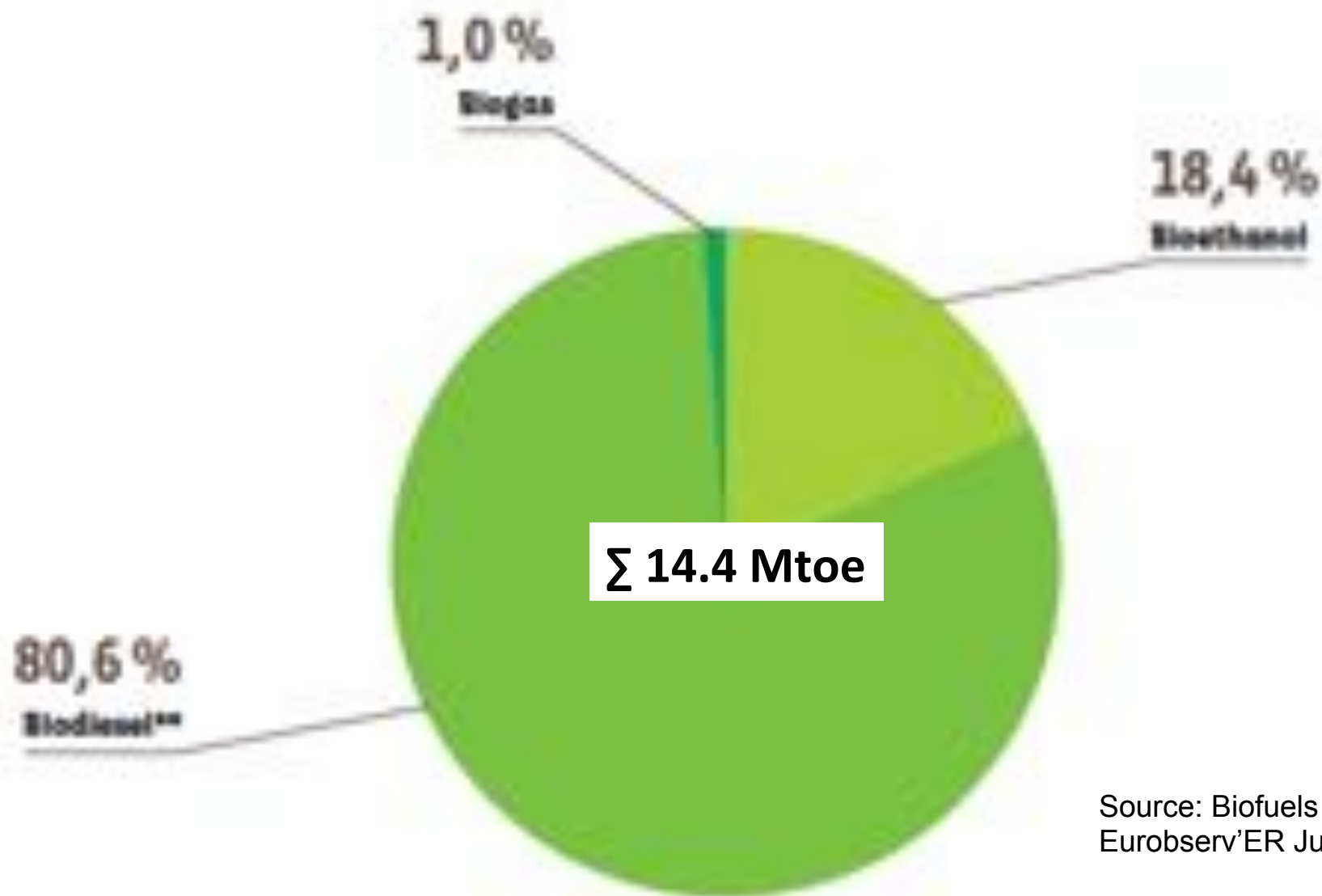
- **10% mandatory target** (2020) for the use of renewable energy in transport
- **Minimum GHG savings** for biofuels:
 - 35% for existing installations until Dec 2016
 - 50% from 1 Jan 2017
 - 60% for new installations from 1 Jan 2017
- Use of **voluntary certification schemes**

Fuel Quality Directive (FQD)

2009/30/EC from 2009

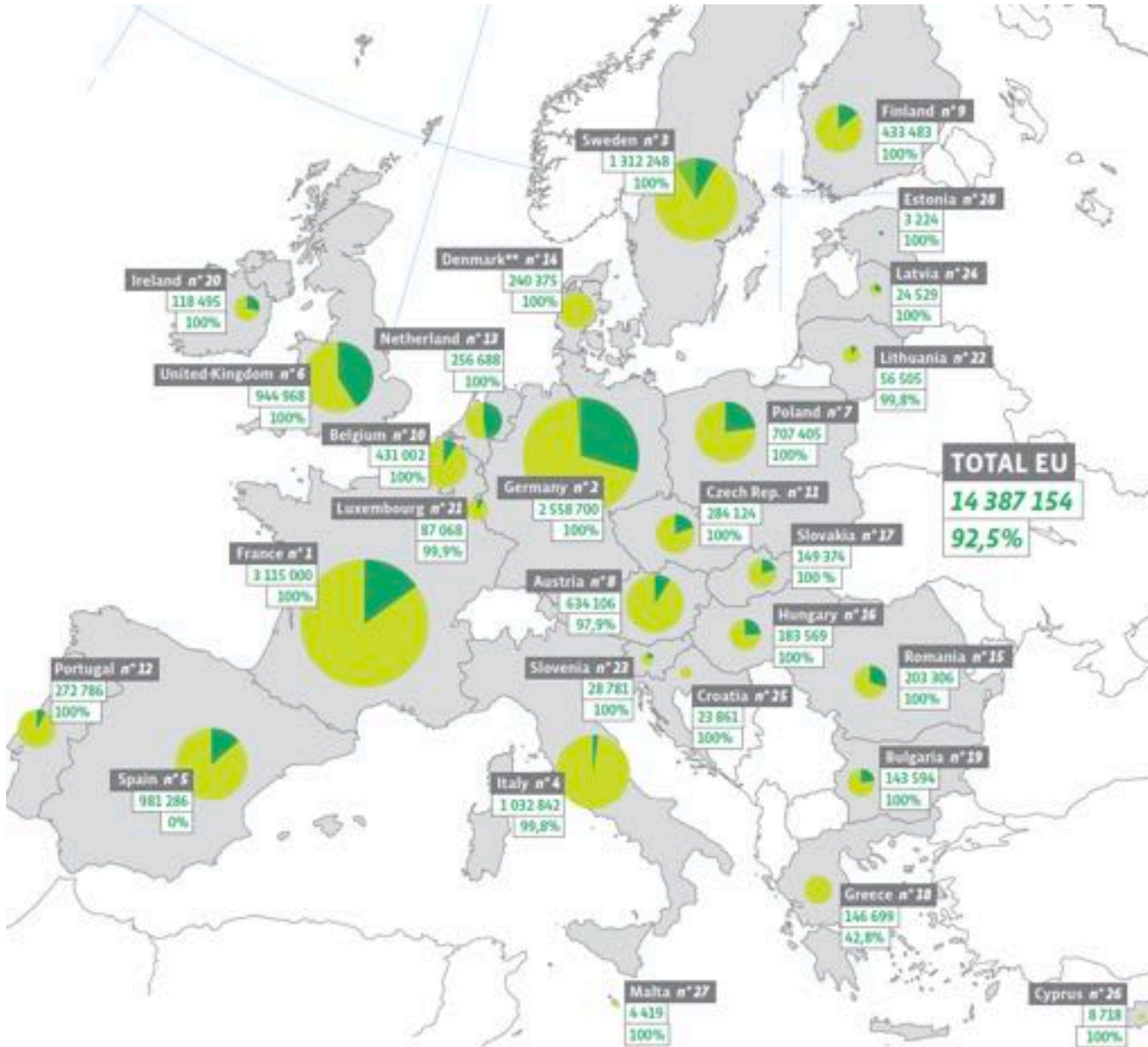
- **Decarbonization** strategy: Obligation for mineral oil companies to gradually reduce life cycle greenhouse gas emissions by a minimum of **6% by 2020**

The EU has a well-established biofuels market despite all political insecurities in recent years



Source: Biofuels Barometer, Euroserv'ER July 2017

The EU market is dominated by biodiesel in all Member States



Country
331 Biofuel consumption for transport (toe)
100% % certified sustainable

Bioethanol Biodiesel*** Biogaz

Source: Biofuels Barometer, Eurobserv'ER July 2017

prohibited.

The RED/ FQD Amendment 2015/1513/EC published in October 2015 will affect biofuel policy until 2020



Renewable Energy Directive (RED)

Fuel Quality Directive (FQD)

2015/1513/EC from 2015

2015/1513/EC from 2015

- **7% cap** on food/feed crop biofuels
- Reference value for national targets: **0.5% for advanced biofuels**
- Annex IX: feedstocks and fuels which can be **double counted** towards national quotas
- Adjusted **GHG methodology**
- **Minimum GHG savings** for biofuels:
 - 35 % for existing installation until Dec 2017
 - 50 % from 1 Jan 2018
 - 60% for new installations* directly

* New installation: Physical production of biofuels/-liquids started after October 2015

The Amendment 2015/1513/EC includes changes in GHG saving thresholds for biofuels

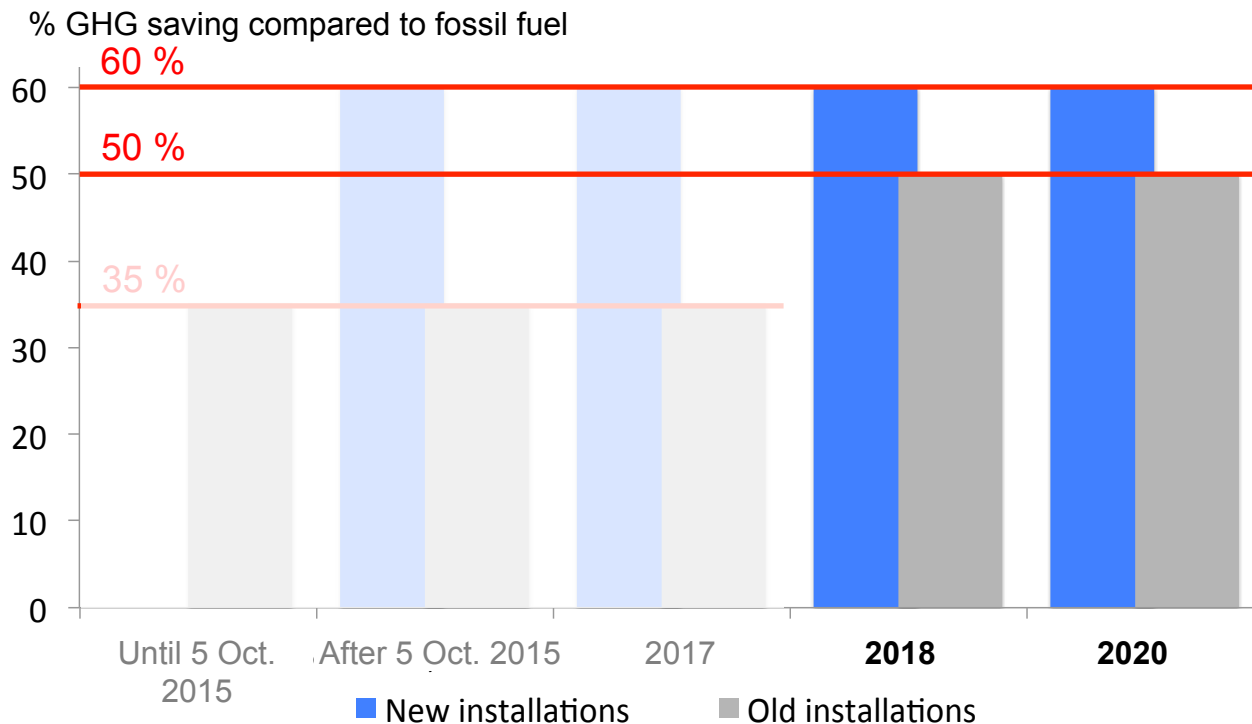


Renewable Energy Directive (RED)

Fuel Quality Directive (FQD)

2015/1513/EC from 2015

2015/1513/EC from 2015



GHG saving requirements for biofuels:

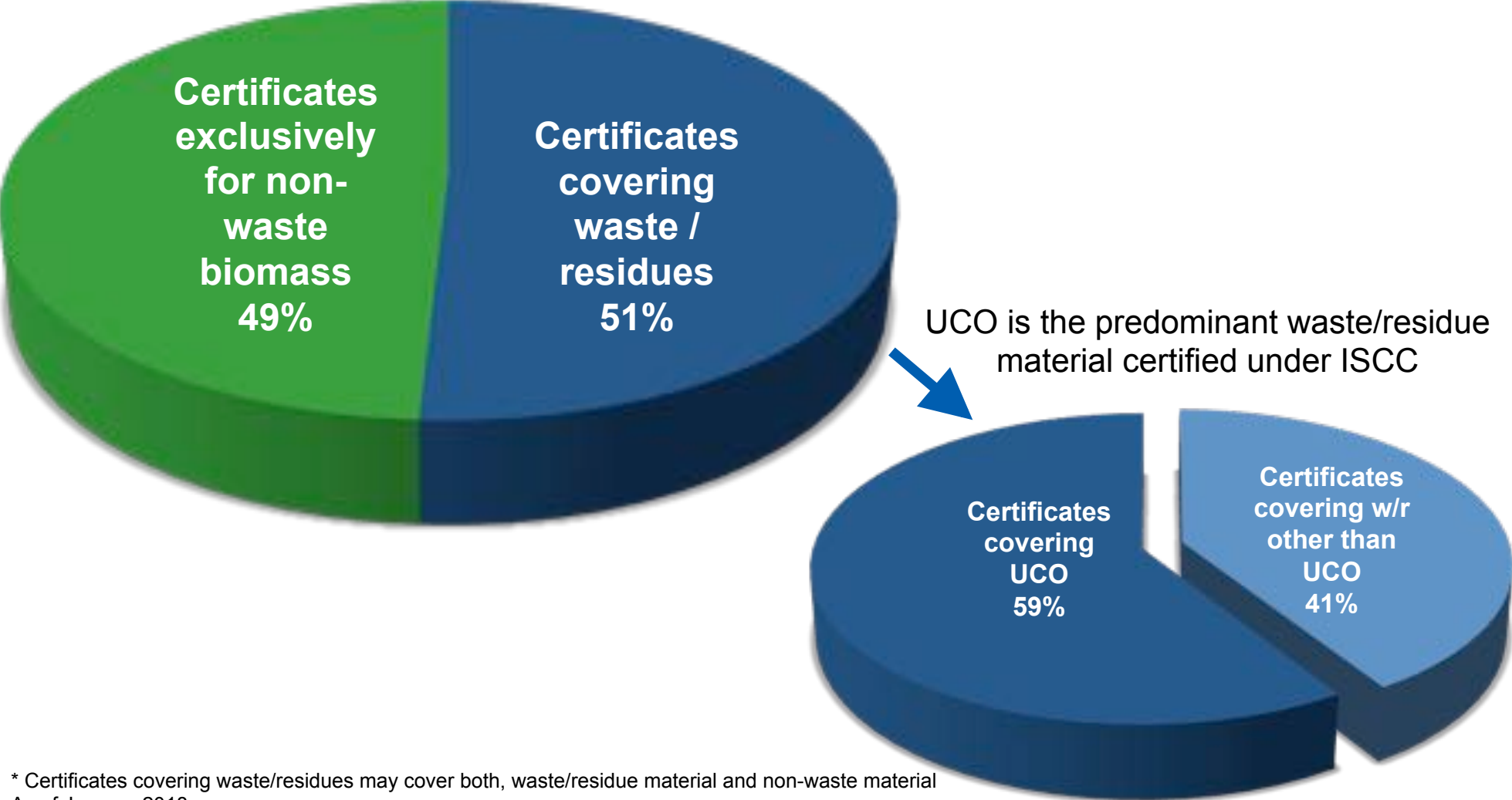
- 35 % for existing installation until Dec 2017
- 50 % from 1 Jan 2018
- 60% for new installations directly

RED II proposal for post 2020. Trilogue negotiations started on 27 February 2018



	European Commission (Feb 2017)	Council of the European Union (Dec 2017)	European Parliament (Jan 2018)
Energy from Renewable Sources	27 %	27 %	35 %
Renewables in the Transport Sector	n/a	14 % (trajectory set by MS)	12 % (for each MS)
Blending Obligation for Low-Emission and Renewable Fuel	6,8%	To translate the 14%, in energy, volume or GHG reduction	10%
Cap on Food/Feed Crop Based Biofuels	7 % (2021) 3,8 % (2030)	7 %	7 % (2017) 0 % for palm oil (2021)
Target for Annex IX Part A (advanced)	0,5 % (2021) 3,6 % (2030)	1 % (2025) 3 % (2030)	0,5 % (2021) 3,6 % (2030)
Limit for Annex IX Part B	Limit of 1.7%	Limit of 1.7%, which can be modified by MS if approved by Commission	No 1.7% limit, but the possibility for MS to define limit

ISCC is a leading certification scheme also for waste, residues and advanced low carbon fuels*



* Certificates covering waste/residues may cover both, waste/residue material and non-waste material
As of January 2018

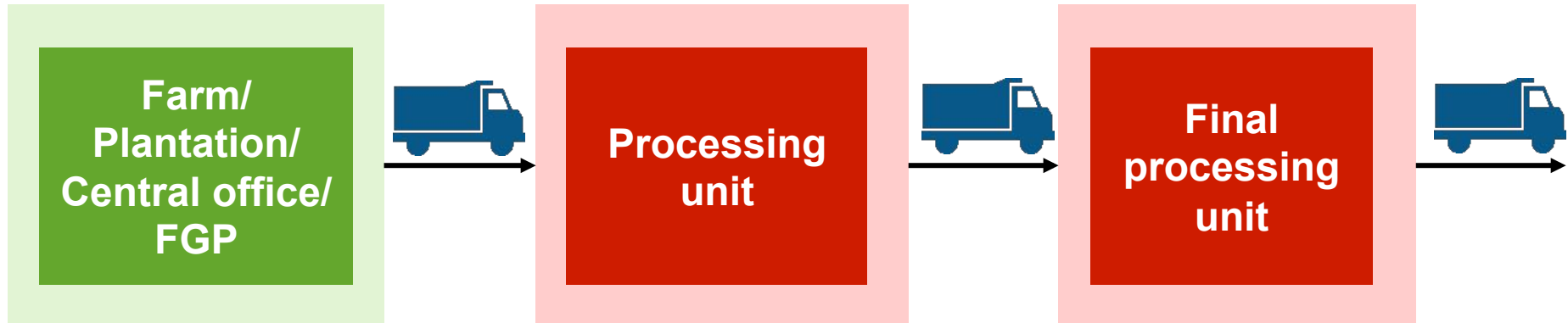
Biofuels lead the way – GHG calculations for global supply chains

ISCC established certified GHG calculations for all stages of supply chain

SD crop:
 e_{ec} : _kg CO₂eq/t_{dry}

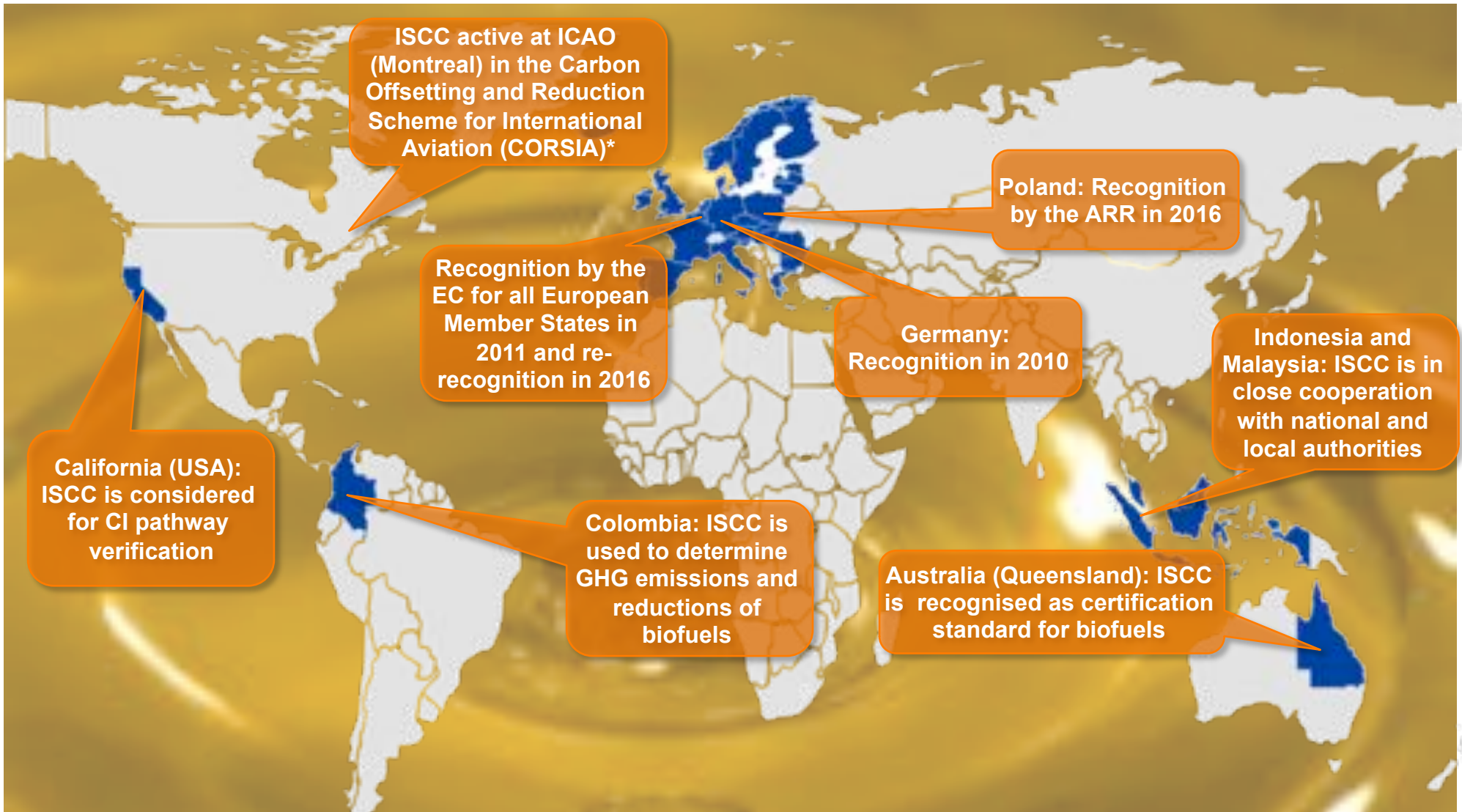
SD product:
 e_{ec} : _kg CO₂eq/t_{dry}
 e_p : _kg CO₂eq/t_{dry}
 e_{td} : _kg CO₂eq/t_{dry}

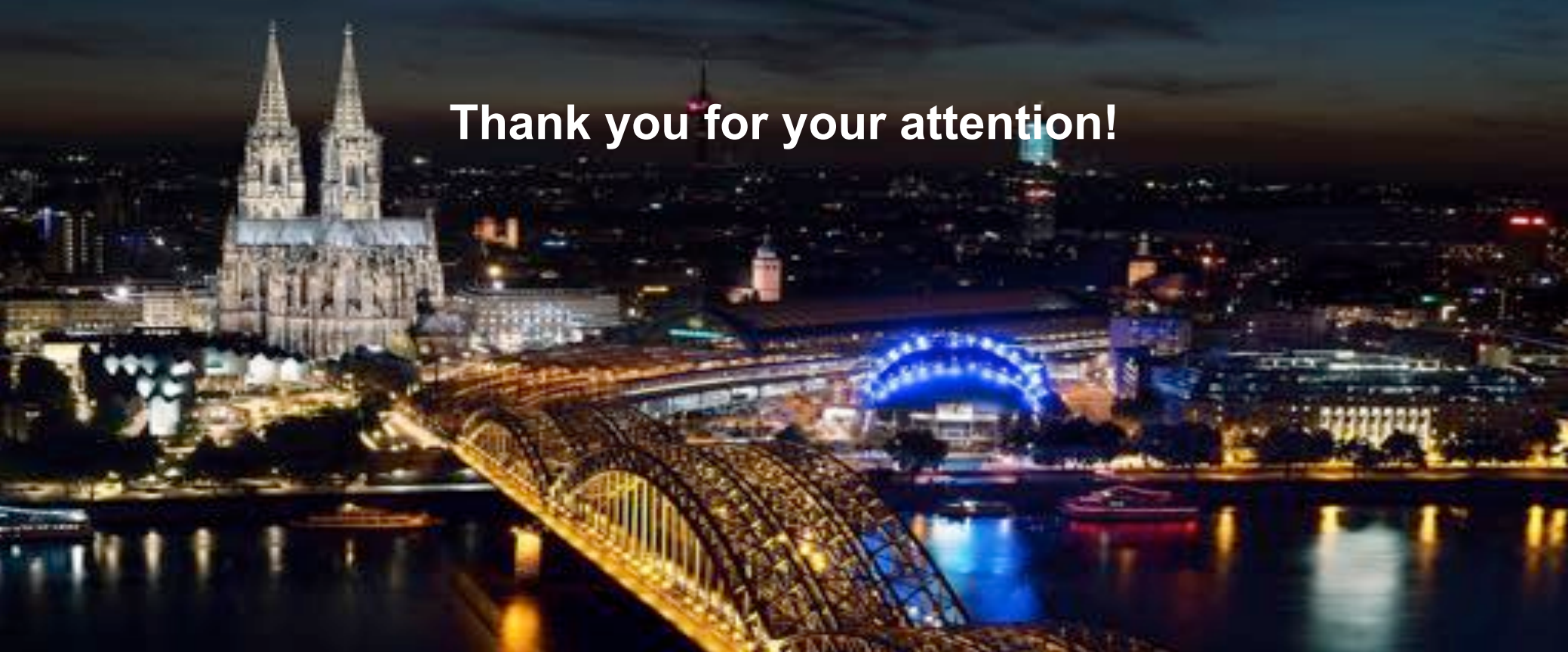
SD for biofuel:
 e_{ec} : _g CO₂eq/MJ
 e_p : _g CO₂eq/MJ
 e_{td} : _g CO₂eq/MJ
E, GHG-%



SD: Sustainability Declaration

ISCC covers most requirements in the different biofuels programs and is working on recognitions in respective markets





Thank you for your attention!

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