

# 《欧盟可再生能源指令II》： 支持低碳燃料

## EU Renewable Energy Directive II: supporting low-carbon fuels

Chelsea Baldino

Researcher, Fuels

研究员      燃料项目组

# 国际清洁交通委员会：目标与活动

## The ICCT: mission and activities

国际清洁交通委员会(ICCT)的目标是通过提高各种车辆及交通系统的环境与能效表现，以保护公众健康、自然环境，提升生活质量。

The mission of ICCT is to dramatically improve the environmental performance and efficiency of cars, trucks, buses and transportation systems in order to protect and improve public health, the environment, and quality of life.

- 非盈利研究机构  
Non-profit research organization
- 空气污染和气候影响  
Air pollution and climate impacts
- 研究监管政策与财政激励措施  
Focus on regulatory policies and fiscal incentives
- 研究涵盖了包括航空和海运的多种交通模式  
Activity across modes including aviation and marine
- 面向全球、关注主要市场  
Global outreach, with special focus on largest markets



# 《欧盟可再生能源指令II》 (RED II) (2018)

## EU Renewable Energy Directive II (2018)

范围：开采与运输阶段 / Scope: Well to tank

可再生能源目标：覆盖公路和铁路交通的10% / Renewable Energy Target: 10% of road and rail transport  
最终的实施方式将由欧盟各成员国自行决定，如总量要求、能源要求或者对于燃料供应商GHG减排的要求

Member States decide how to implement: e.g., volume mandate, energy mandate, or GHG reduction requirement for fuel suppliers

计算燃料碳排放强度：不同材料的开采或种植、土地用途的直接变化、加工、运输和分配，以及使用的燃料、更好的农业管理产生的土壤碳积累、碳捕获和储存或替代产生的排放节省

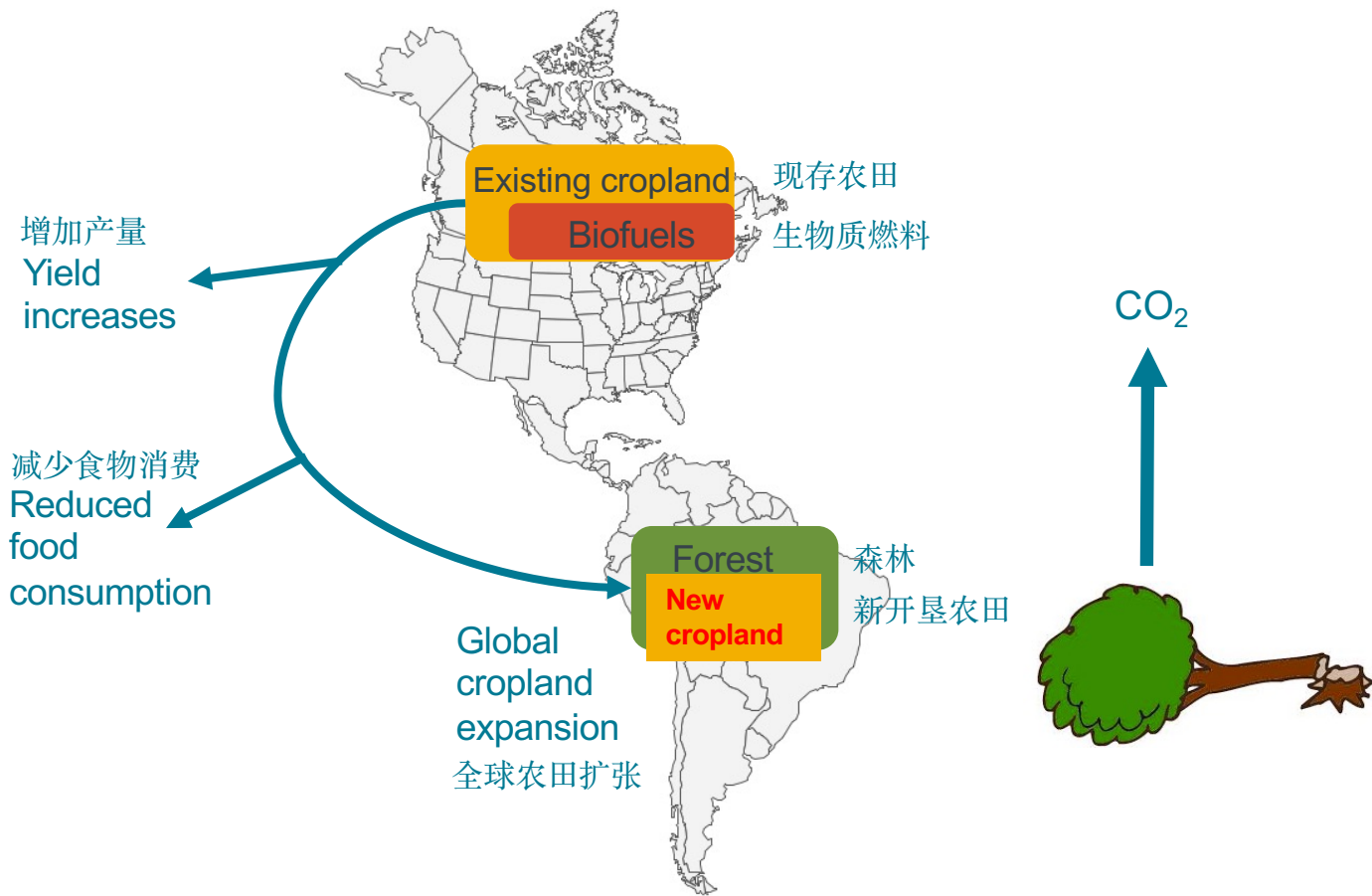
Calculate GHG intensity of fuel: emissions from extraction or cultivation of different materials, direct land use change, processing, transport and distribution, fuel in use, soil carbon accumulation from better agricultural management, emission savings from carbon capture and storage or replacement

与最低温室气体减排目标相应的化石燃料使用量对照 / Minimum GHG reduction target relative to a fossil comparator

- 非生物来源可再生燃料 (RFNOBs, 例如电解氢、合成燃料)：减少70% / Renewable Fuels of Non-Biological Origin (RFNBOs, e.g., electrolysis hydrogen, electrofuels): 70% reduction
- 生物燃料：减少50-60% / Biofuels: 50-60%

# 间接土地利用变化

## Indirect land use change (ILUC)



## 《欧盟可再生能源指令II》 如何规定间接土地利用变化（ILUC）？ How does the RED II address ILUC?

不包括间接土地利用变化 / GHG intensity of fuel pathways does not include Indirect Land Use Change

- 限制基于食物和饲料的燃料（7%） / Cap on food and feed-based fuels (7%)
- 淘汰间接土地利用变化大的原料(棕榈油) / Phase out of “high-ILUC” feedstocks (palm oil)

# 《欧盟可再生能源指令II》 通过多种手段支持低碳燃料

## Support for low-carbon fuels in RED II

对于电动车辆使用的可再生电力和燃料采用4倍乘数进行计算

4x multiplier for renewable electricity used in Electric Vehicles (EVs) or RFNBOs

指令规定需有3.5%的燃料由废料和残渣制得（在附录9中详细定义）

3.5% mandate for fuels made from wastes and residues (defined in Annex 9A)

- 例如农业残渣、动物排泄物、污水污泥和藻类  
e.g., agricultural residues, animal manure, sewage sludge, and algae

对于附录9A和废油（附录9B）采用2倍乘数进行计算

2x multiplier for Annex 9A and waste oils (Annex 9B)

船舶和航空中使用的可再生燃料（非食物燃料）采用1.2倍乘数进行计算

1.2x multiplier for renewable fuels used in marine and aviation sectors (but not food-based)

# 《欧洲绿色协议》相应变化

## EU Green Deal changes

- 为了在2030年前达到《欧盟气候法》所规定的温室气体减排55%的目标（以及在2050年前达到碳中和）

To align with 55% reduction in GHG emissions required by 2030 (and net neutral by 2050) under EU Climate Law

- 修订后的《可再生能源指示II》提案（非最终版本）

Revised RED II proposal (not finalized)

- 将所有交通能源的减排目标改为13%

Changes energy target to GHG intensity reduction of 13% for all transport energy

- 增添了非生物来源可再生燃料的目标

Adds RFNBO target

# 《可再生能源指示II》的修订提案

## Proposed RED II revision

- 当前可再生能源目标 / Renewable Energy Target (current)
  - 除了前述多倍乘数的使用以外，其余所有的燃料方案都采用相同的计算方法  
All fuel pathways count the same towards meeting the target, except for when multipliers are used
    - 制造1升的小麦乙醇无论是否使用碳捕捉和封存技术（CCS）都视为相同的排放  
1 liter of wheat ethanol with or without carbon capture and storage (CCS) counts the same
- 温室气体强度减排目标 / GHG Intensity Reduction Target
  - 每种燃料方案对温室气体减排产生不同的贡献  
Each fuel pathway generates different GHG reduction credits
    - 使用碳捕捉和封存制造的1升小麦乙醇比没有使用该技术制造的能减少更多温室气体排放  
1 liter of wheat ethanol with CCS generates more GHG reduction savings than without
- 温室气体强度目标更具有挑战性，ICCT的研究表明该目标能够采用更低的成本实现更大的减排量  
GHG intensity target is more ambitious and ICCT research shows it achieves greater overall GHG savings at lower cost

## 开采和运输过程尚未纳入当前二氧化碳排放标准

### Well to tank crediting not included in tailpipe CO<sub>2</sub> standards

- 替代燃料相比于电动车更昂贵

Alternative fuels are costly compared to Battery Electric Vehicles (BEVs)

- 用替代燃料生产的汽车比电动车更昂贵

More costly to produce cars using alternative fuels compared to BEVs

- 相比于合成燃料汽车，电动车能效更高

BEV use electricity more efficiently than eFuels

- 用于生产合成燃料的电力里只有约16%最终用于汽车驱动，而电动车可以达到72%

~16% of the original electric energy used to produce eFuels ends up being used for propelling a vehicle, compared to 72% for BEV

# 总结

## Summary

- 《可再生能源指示II》的范围是从开采到运输阶段，其它法规则监管使用阶段  
Scope of RED II is well-to-tank and other regulations manage tank-to-wheel
- 间接土地利用变化需要重视——欧盟通过设置上限和淘汰的方式进行管理  
ILUC is important - EU handles it with caps and phase-outs
- 支持低碳燃料——可持续电力以及废料和残渣  
Support for low-carbon fuels - renewable electricity and wastes and residues
- 《可再生能源指示II》的修订提案是一项温室气体减排目标方案，从而支持比设立能源强制要求更优的最低碳路径  
RED II revision proposal is a GHG reduction target supporting lowest carbon pathways better than energy mandate
- 替代能源也很重要，不过多数将被用于最难以降低碳排放的领域，例如航空和船舶等  
Alternative fuels play an important role but will be used most by hardest-to-decarbonize sectors like aviation and marine

Questions? 问题?  
[chelsea.baldino@theicct.org](mailto:chelsea.baldino@theicct.org)

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# 《欧盟绿色协议》中与燃料相关的其它提案

## Additional fuels-related proposals from EU Green Deal

### ReFuelEU航空指令 / ReFuelEU aviation mandate

- 针对由废料和残渣制得的可持续生物燃料用于航空燃料的总量规定（罗列于附录9）

Volume mandates for sustainable aviation fuel from waste and residue biofuel (as listed in RED II Annex 9) and RFNBOs

- 不包括来源于食物和饲料的燃料

Does not include food and feed-based fuels

	可持续航空燃料	合成航空燃料
	Sustainable aviation fuel	Synthetic aviation fuels
1 January 2025/ 2025年1月1日	2%	--
1 January 2030/ 2030年1月1日	5%	0.7%
1 January 2035/ 2035年1月1日	20%	5%
1 January 2040/ 2040年1月1日	32%	8%
1 January 2045/ 2045年1月1日	38%	11%
1 January 2050/ 2050年1月1日	63%	28%

# 船舶燃料

## FuelEU Maritime

- 相比于2020年平均船队温室气体排放强度 / GHG reduction compared to fleet average greenhouse gas intensity from 2020
- 2025年下降2% → 2050年下降75% / -2% in 2025 → -75% in 2050
- 燃料温室气体排放强度的计算遵从《欧盟可再生能源指令II》的相关方法学 / Fuel GHG intensity calculated following RED II methodology
- 不包括来源于食物和饲料的燃料 / Food-based fuels do not count
- 可以允许使用LNG，但是会对甲烷泄漏进行处罚 / Liquefied natural gas (LNG) does but penalty applied for methane slip
- 履约过剩的积分将会被储存 / Over-compliance credits may be banked