



SUSTAINABLE
ENERGY FOR ALL

Sustainable Ethanol Fuel for Rural Development
and a Low Carbon Future

有利于农村发展和低碳未来的可持续乙醇燃料

U. S. Grains Council

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Global Lead 全球领导力

Sustainable Bioenergy High-Impact Opportunity

可持续生物能源高影响力机遇

Sustainable Energy For All

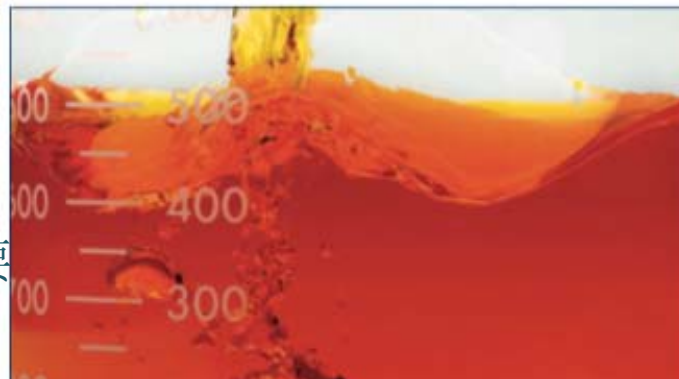
人人享有可持续能源

NARRATIVE 简述

- Biofuels are necessary to de-carbonize the transportation
生物燃料对于交通减碳十分重要
- The misunderstanding regarding the relationship between Biofuels and Food Security is a barrier to increased use
对生物燃料和粮食安全之间关系的误解是影响推广的障碍
- New policy tools create the opportunity to accelerate biofuel deployment
新的政策工具为加速发展生物燃料创造了机会
- International Agencies are now working to up-scale Sustainable Biofuel Production and Use
各国际机构都在致力于扩大可持续生物燃料生产和使用的规模

Low carbon fuels are essential to achieving our environmental, social and economic goals

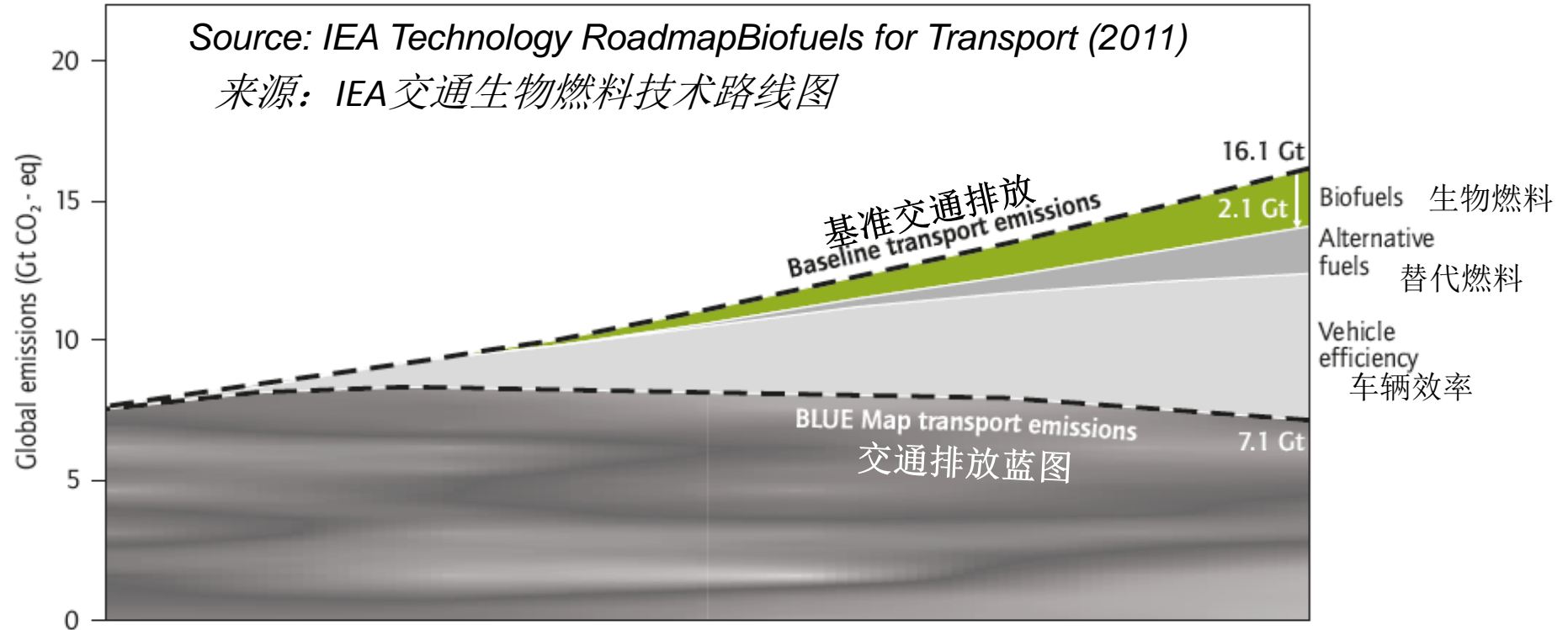
低碳燃料对于实现环境、社会和经济目标至关重要



International Energy Agency: 国际能源组织:

To limit warming below 2° C Sustainable Biofuels are needed to reduce emissions from the Transport Sector

要将气候变暖幅度控制在2° C以内，交通领域需要使用可持续燃料，减少排放

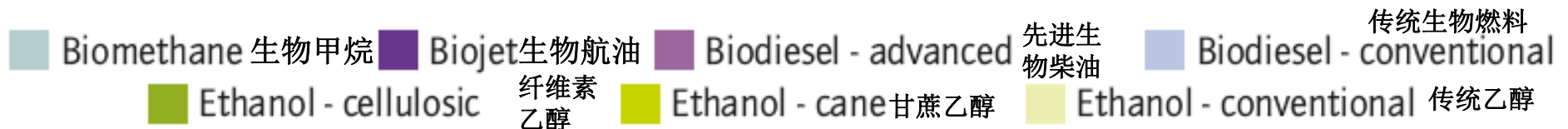
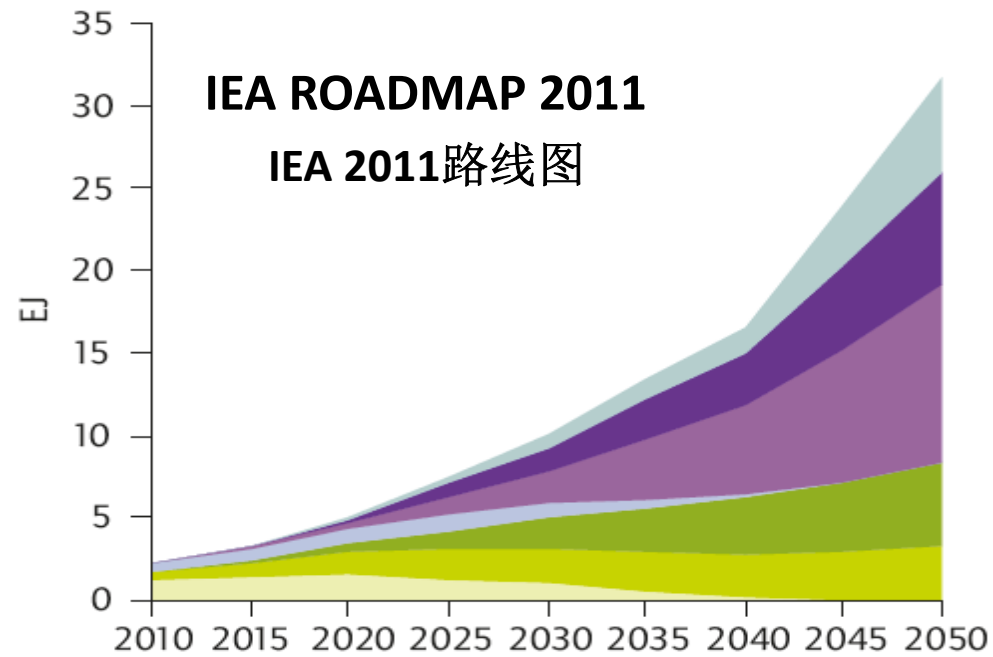


Note: Modal shifts (not included) could contribute an additional 1.8 Gt CO₂-eq. of emission reductions.

- Efficiency improvements are essential to reduce transport emissions
提高效率对减少交通排放至关重要。
- Biofuels can reduce global transport emissions by 2.1 Gt CO₂-eq. in 2050
生物燃料到2050年能使全球交通排放减少相当于2.1 Gt二氧化碳。
- To achieve these reductions, all biofuels must provide considerable life-cycle GHG emission reductions
要实现减排目标，所有生物燃料都必需能够全周期减少温室气体排放。

To remain below 2° C of warming, Sustainable Biofuels are needed to reduce GHG emissions from the Transport Sector

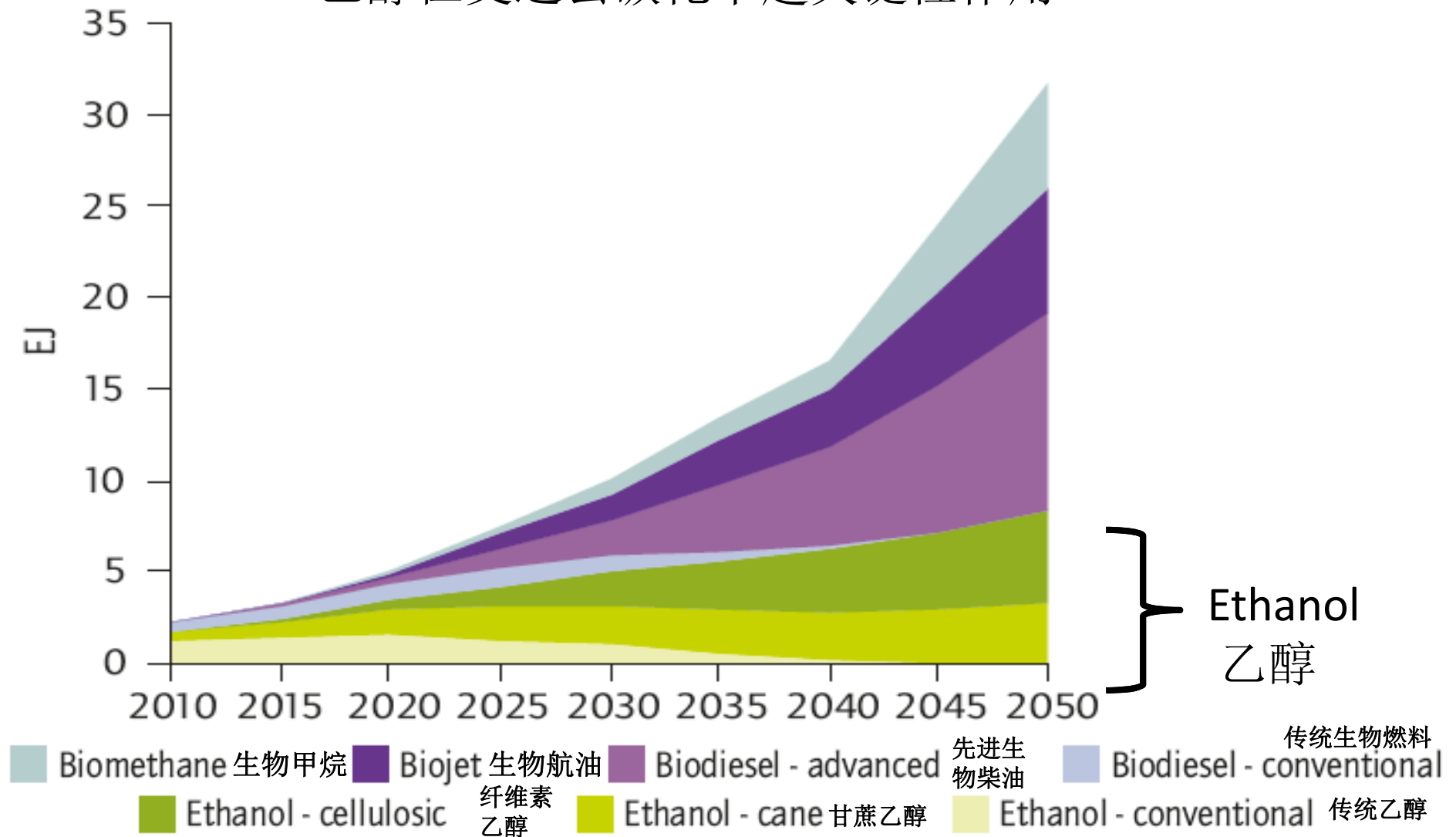
要将气候变暖幅度控制在2° C以内，交通领域需要使用可持续燃料，减少排放



- Global biofuel supply grows from 2.5 EJ today to 32 EJ in 2050
2050年全球生物燃料的供应从现在的2.5 EJ增长到32 EJ。
- Biofuels share in total transport fuel increases from 2% today, to 27% in 2050
2050年生物燃料在整个交通燃料中的份额从现在的2%增长到27%
- In the longer-term, diesel/kerosene-type biofuels are particularly important to decarbonise heavy transport modes
长远来看，柴油/煤油类生物燃料对于重型运输的去碳化尤为重要。
- Large-scale deployment of advanced biofuels vital to meet the roadmap targets
大规模开发新一代生物燃料对于实现路线图目标起决定性作用。

Ethanol will play an essential role in de-carbonizing transport

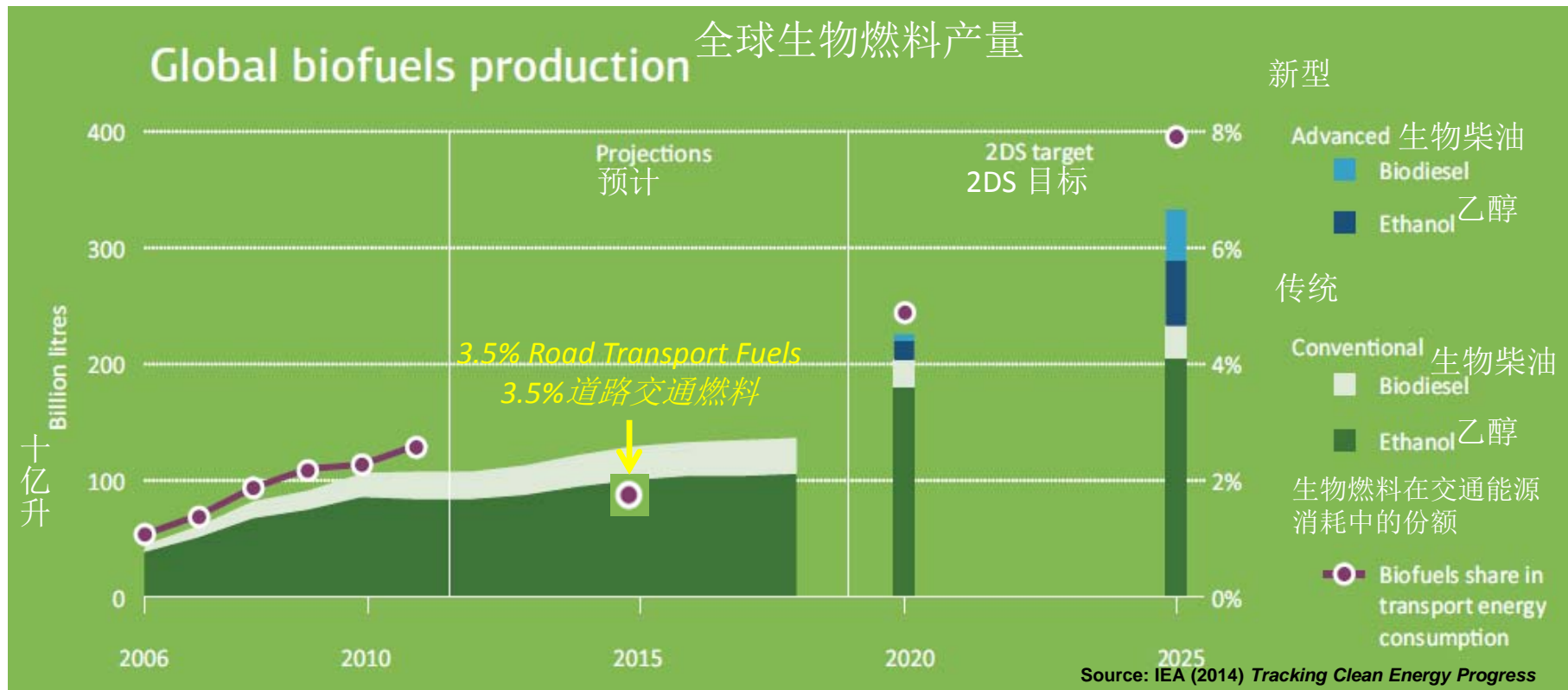
乙醇在交通去碳化中起关键性作用



- Due to technological advances corn ethanol is becoming advanced with emissions reductions > 50% relative to gasoline
得益于技术进步，玉米乙醇与汽油相比，减排超过50%，效果显著。

Biofuel use is not meeting IEA Biofuel Roadmap Goals

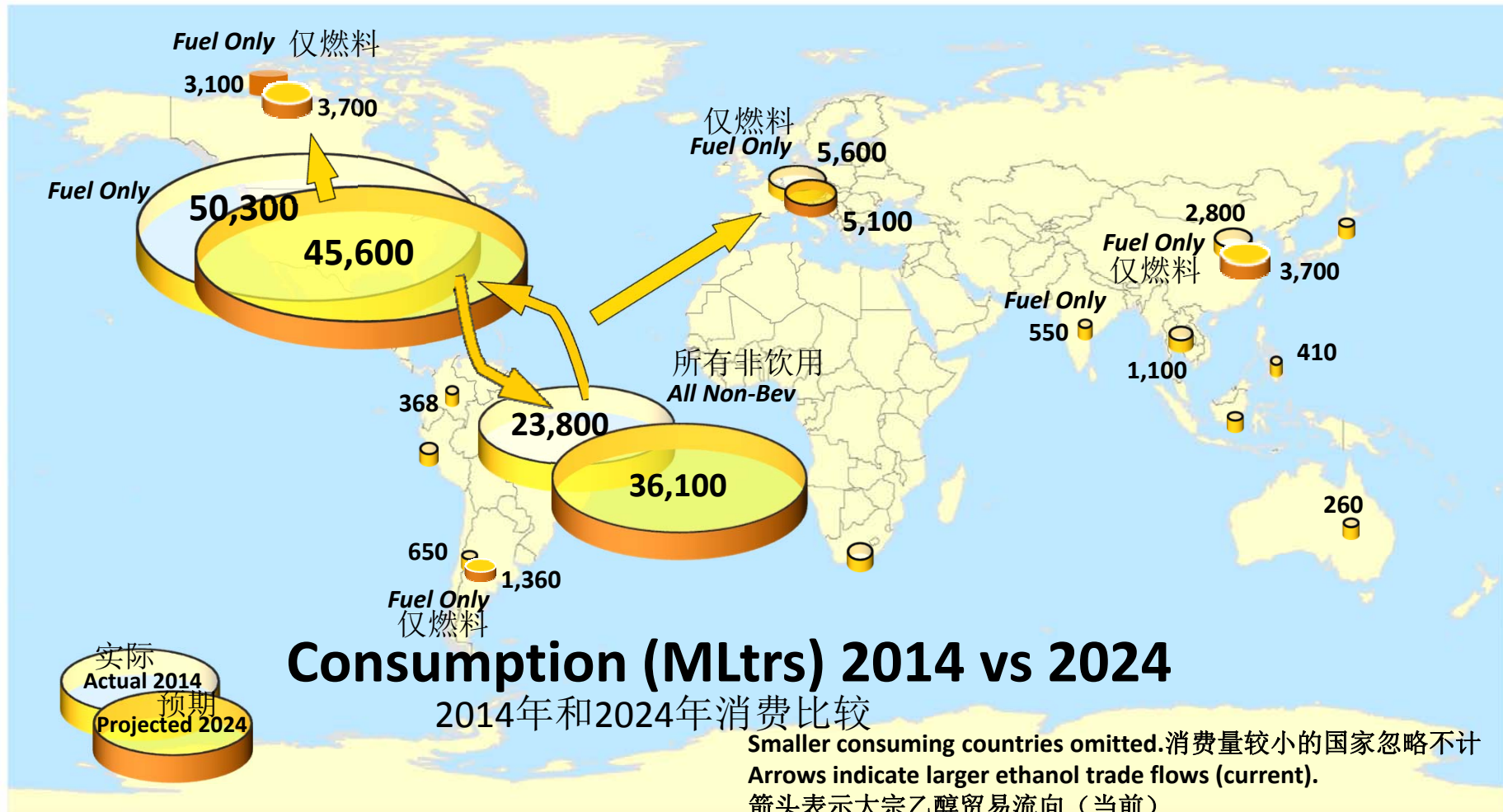
生物燃料的应用尚未实现国际能源署生物燃料路线图的目标



- Biofuels production affected by policy uncertainties in a number of key markets.
生物燃料生产在多个主要市场中受到政策不确定性的影响。
- Without significant improvements of the policy framework for advanced biofuels, long-term targets (27% in 2050) will not be met.
如果与先进生物燃料相关的政策框架没有显著改善，长远目标（2050年占比27%）很难实现。
- Need to create new biofuel markets.
需要开发新的生物能源市场。

Projected Ethanol Use in Asia is Insufficient

亚洲的预期乙醇消费不足

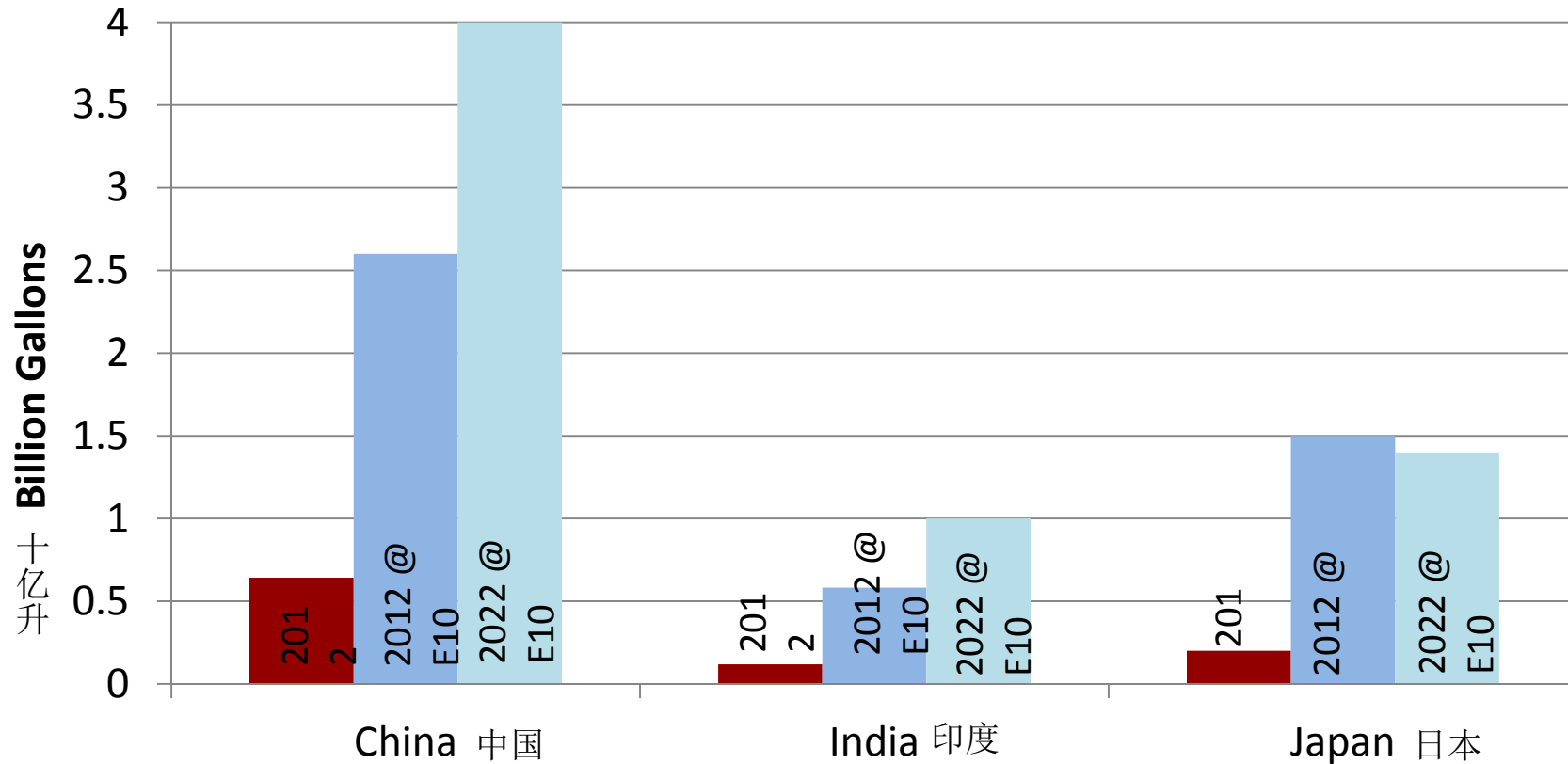


Failure to use ethanol in Africa and Asia will be a missed opportunity to
非洲和亚洲未能利用乙醇使他们失去了如下机会

- De-carbonize the transportation sector; and 交通领域去碳化和
- Increase regional investment in Agriculture. 增加区域农业投入

E10 in Asia requires 20 - 25 Billion Liters of Ethanol

在亚洲发展E10燃料需要200到250亿升乙醇



Stable ethanol demand in Asia would stimulate investment in Agriculture in Asia; thereby, increasing yields and *increasing* food security.

亚洲对乙醇的稳定需求将会刺激亚洲的农业投入，提高单产，提高粮食安全。

Barriers to Bioenergy Deployment

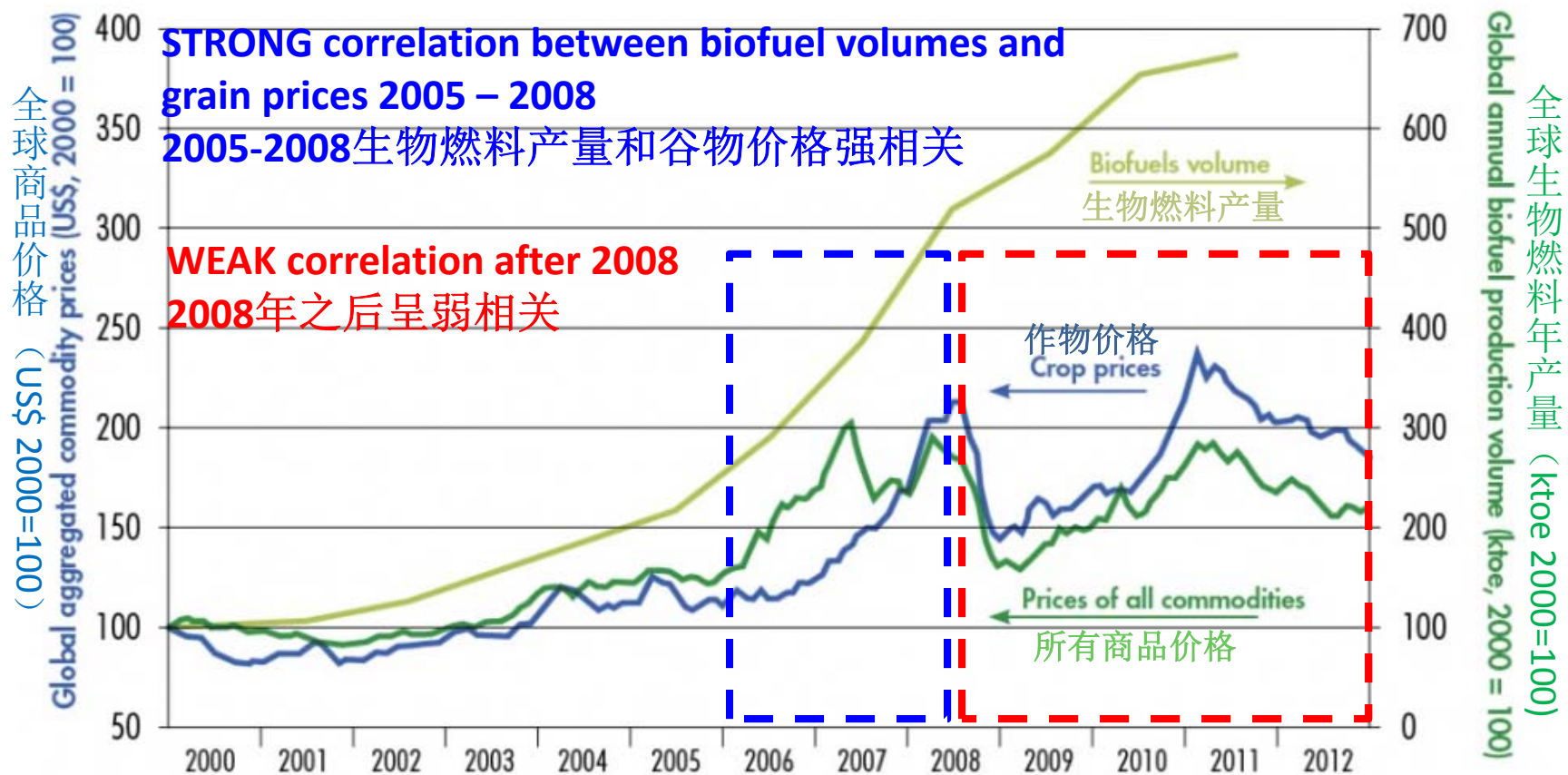
开展生物能源的障碍

- Lack of Awareness and Understanding of Bioenergy
缺乏对生物能源的理解和相关意识
- **Perception that Bioenergy is Unsustainable**
认为生物能源不可持续的观点
- Lack of Policy Stability 政治稳定性较差
- Lack of Catalytic Finance 缺乏催化金融
- Lack of Sustainable Supply Chains 缺乏可持续的供应链
- Poor yields, Bad roads, etc 单产低，路况差，等等

Misunderstanding the “Food and Fuel” relationship

对“食品和燃料”关系的误解

- Commodity prices spiked in 2008, including food prices.
2008年商品价格出现暴涨，包括粮食价格。
- Biofuels were blamed.
生物燃料被指难辞其咎。
- Since 2008, biofuel production increased but grain prices fell.
2008年以来，生物燃料产量上涨而谷物价格下跌。
- Despite contrary evidence “Food versus Fuel” story is still propagated.
尽管与事实证据相左，“粮食燃料相争”的故事仍然盛行。
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Critics assume direct competition between Food and Ethanol that harms the Global Poor

批评者推定粮食和乙醇之间存在直接竞争关系，损害了世界贫困人口

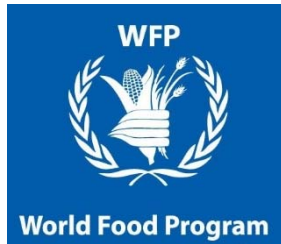
哦，不，你们不能吃这玉米！这是用来制造乙醇的，好给我的SUV提供动力！



For Ethanol to compete with Food乙醇与粮食竞争的说法声称:

1. The amount of food in the world must be limited; and 全世界粮食的总量是有限的，而且
2. The global price of grain determines local food availability. 全球谷物价格决定了当地的粮食可获得性。

Hunger is NOT caused by a Global lack of food
饥荒并不是全球粮食不足导致的



What causes Hunger?
是什么导致了饥荒?

www.wfp.org/hunger/causes

- The world produces enough to feed the entire global population of 7 billion people.
全球的粮食产量足够满足世界上70亿人口所需。
- And yet, one person in eight on the planet is hungry.
而在这个星球上，八个人中就有一个人在忍饥挨饿。

1. **POVERTY TRAP** 贫穷困境

2. **LACK OF INVESTMENT IN AGRICULTURE** 农业投入不足

3. **CLIMATE AND WEATHER** 气候条件和天气

4. **WAR AND DISPLACEMENT** 战争和流离失所

5. **UNSTABLE MARKETS** 市场动荡

6. **FOOD WASTAGE** 粮食浪费

Hunger is driven by local conditions.

饥荒是当地情势导致的

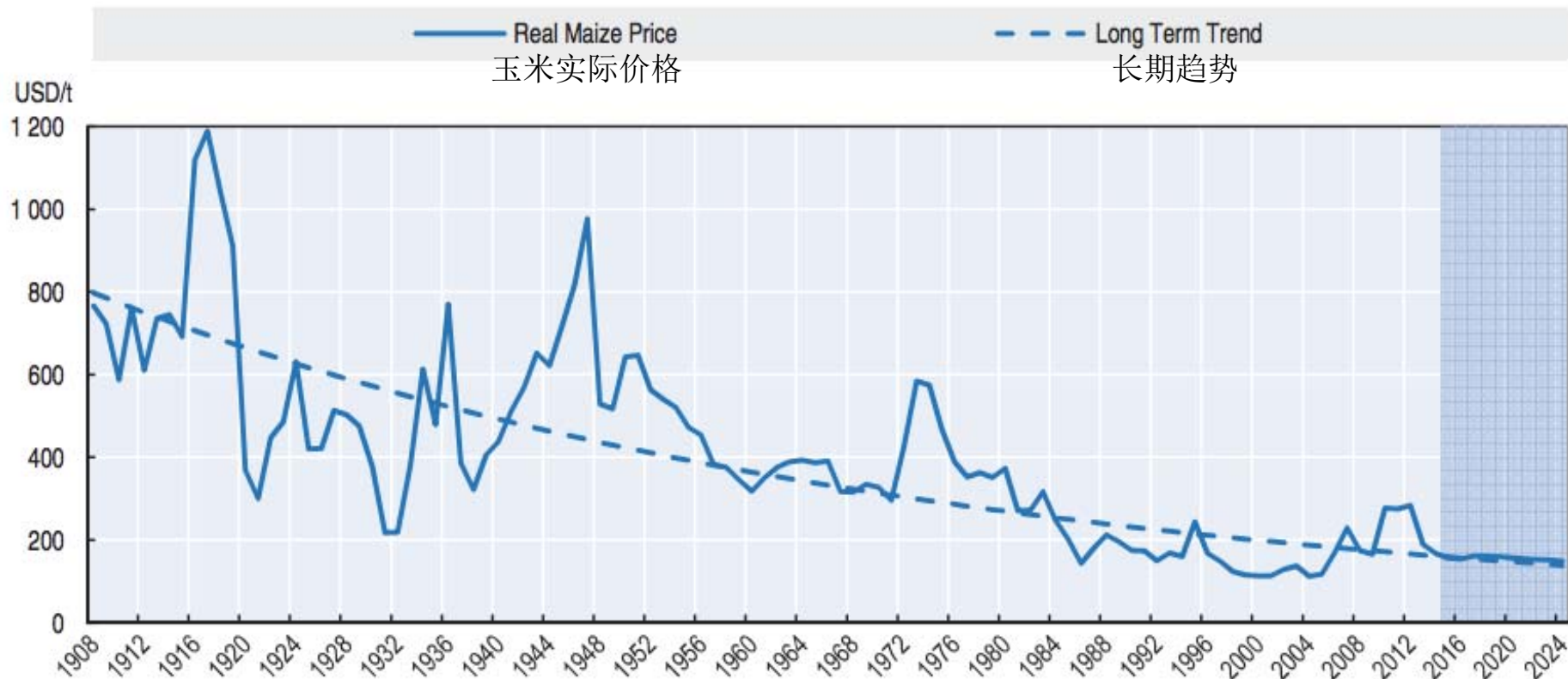
Corn is getting cheaper: 玉米的价格在走低:

Supply is meeting demand at the global level.

全球的供应均能满足需求。

Long-term price of maize in real terms 1908 – 2024

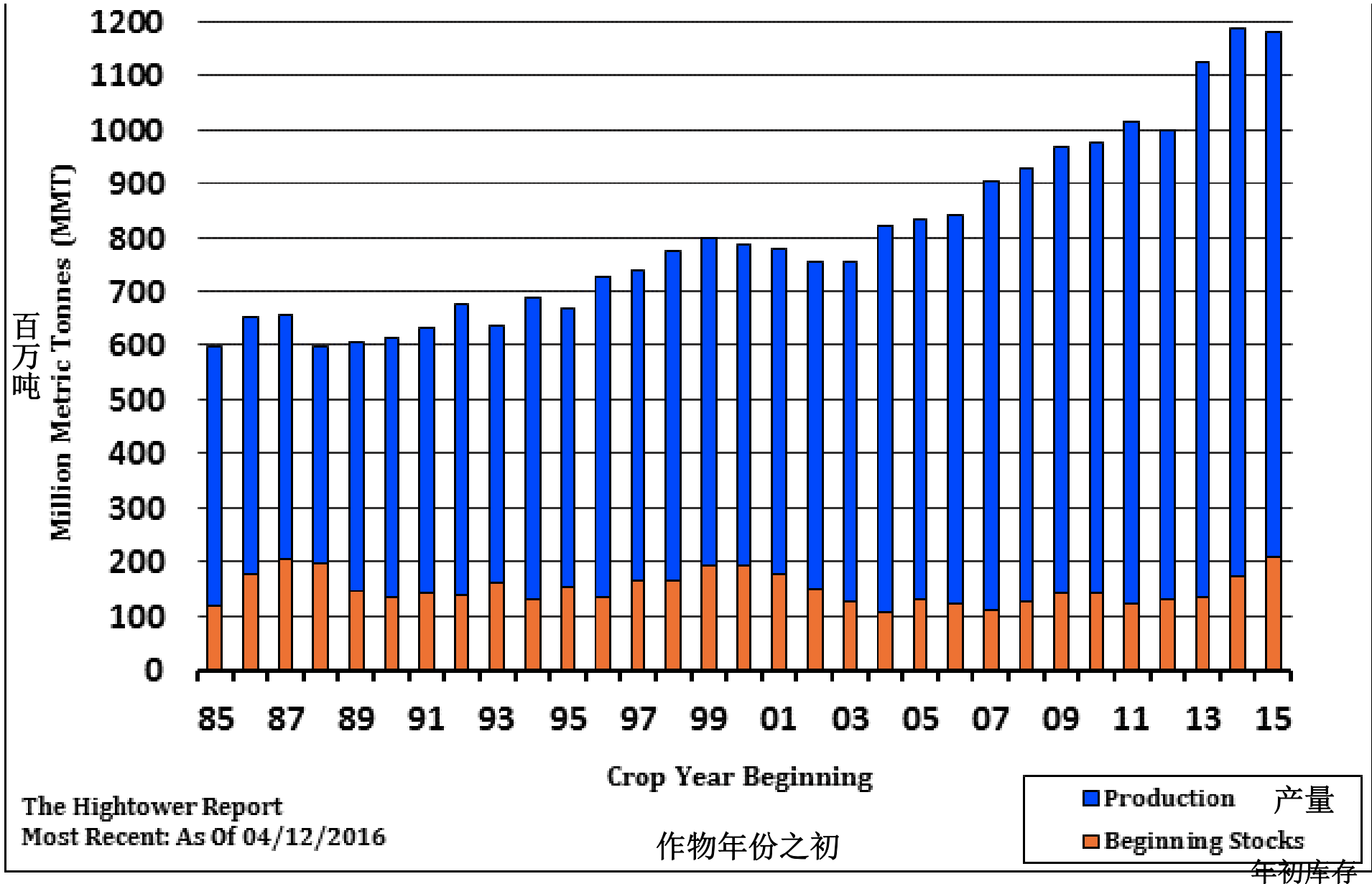
1908 – 2024玉米长期实际价格 (美元/吨)



Note: The US yellow #2 Gulf maize price is used as a benchmark for the coarse grain world market price. This price is recorded back to 1960 in World Bank datasets as monthly data. Monthly prices were converted to annual averages using the maize marketing year September-August. For the years 1908-59 the series is extended using the relative changes in "corn price received" from the USDA quickstats. Nominal prices are deflated using the consumer price as reported by the Federal Bank (www.minneapolisfed.org/community_education/teacher/calc/hist1800.cfm).

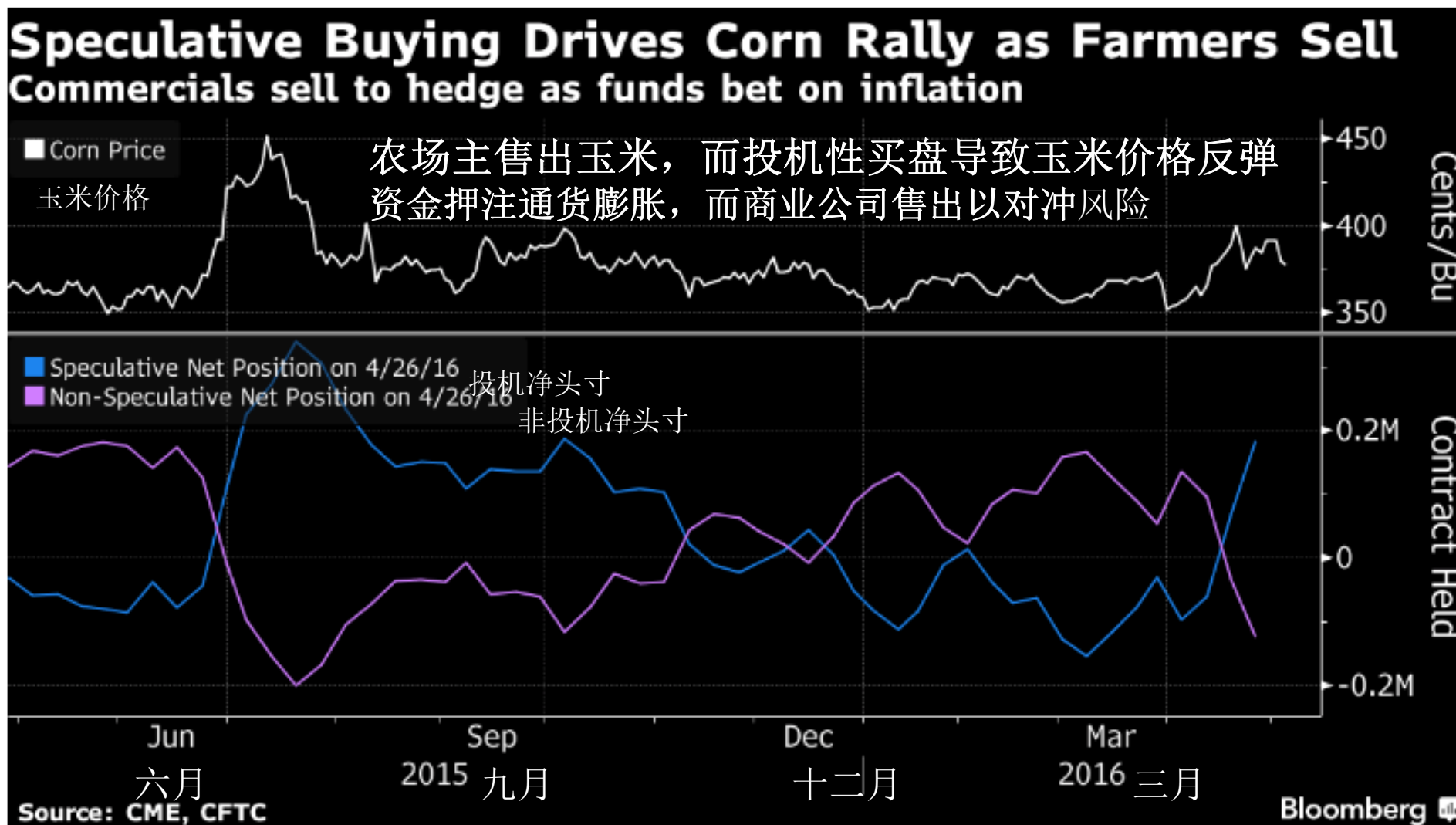
Global Corn Supply has proven to be elastic in response to increased demand for Feed and Fuel

事实证明全球玉米供应的弹性能够应对饲用和燃料需求的增长



In 2016 corn is selling between \$3.50 and \$4.00 a bushel, yet ethanol production is as high as ever.

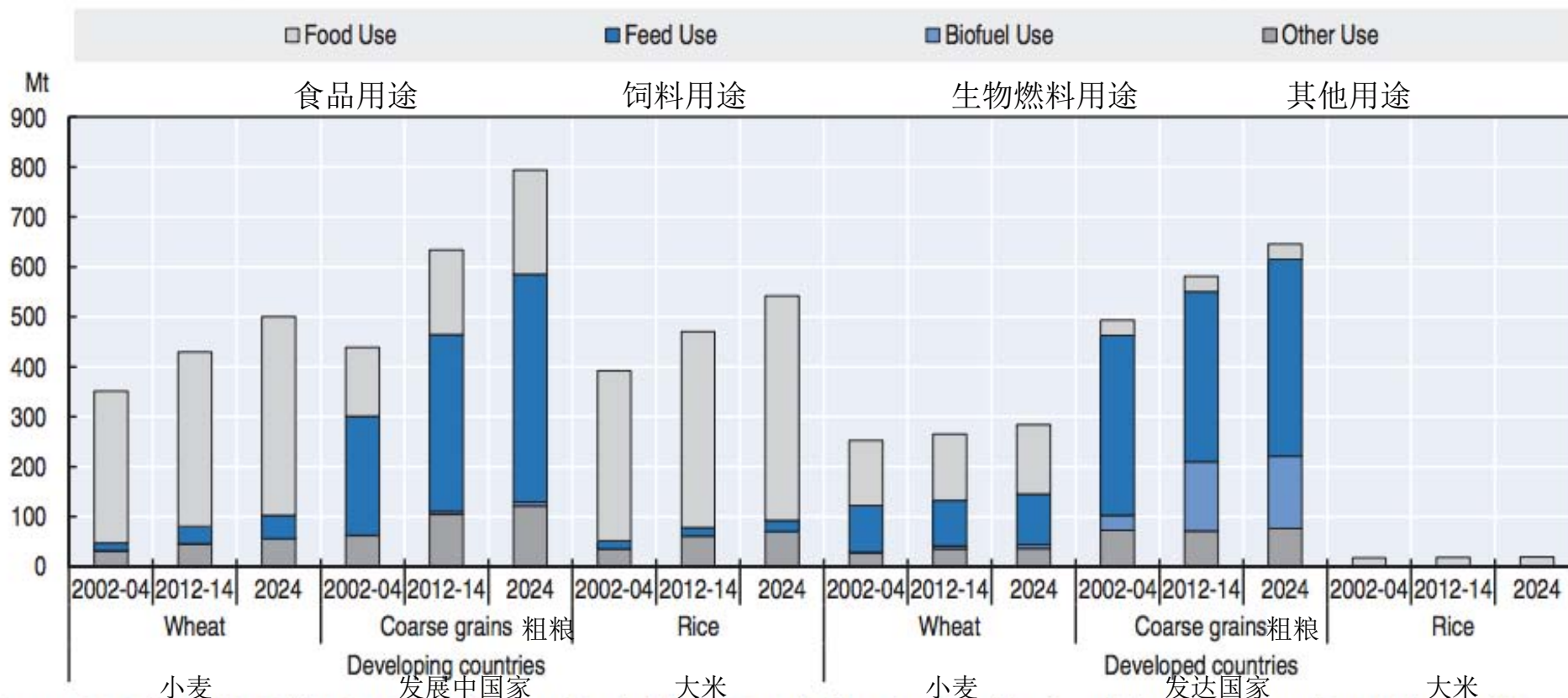
2016年，玉米价格为每蒲式耳\$3.50到\$4.00，而乙醇产量与以往一样高。



OECD-FAO Outlook: Main uses of cereals in developed and developing countries 2014 – 2024

经合组织-粮农组织展望：2014-2024年发达国家和发展中国家谷物的主要用途

The dominant use of coarse grains is for animal feed.
粗粮的主要用途为动物饲料。

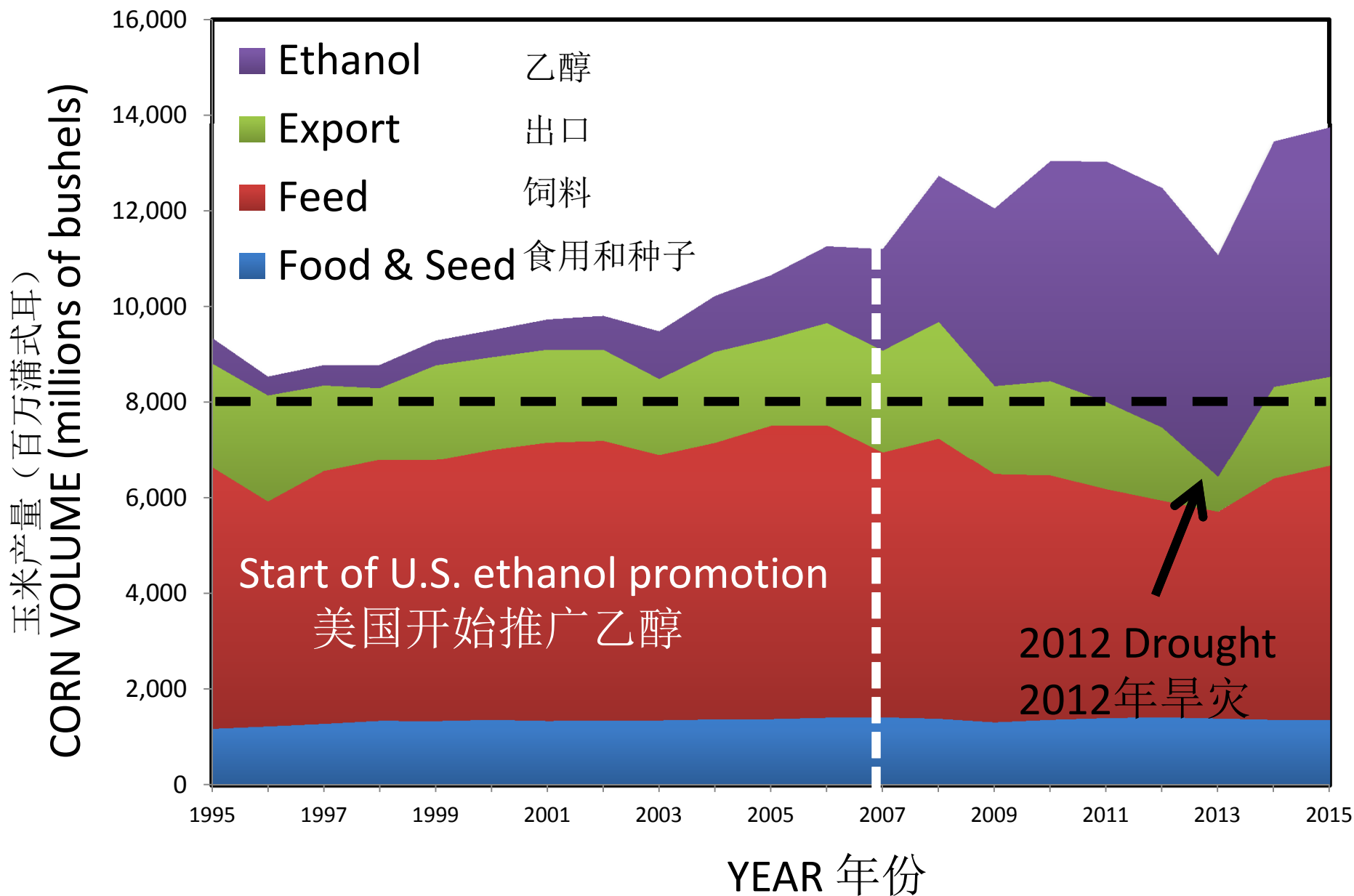


Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture Statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.
来源：经合组织-粮农组织农业展望，OECD农业统计数据库

DEVELOPING 发展中国家

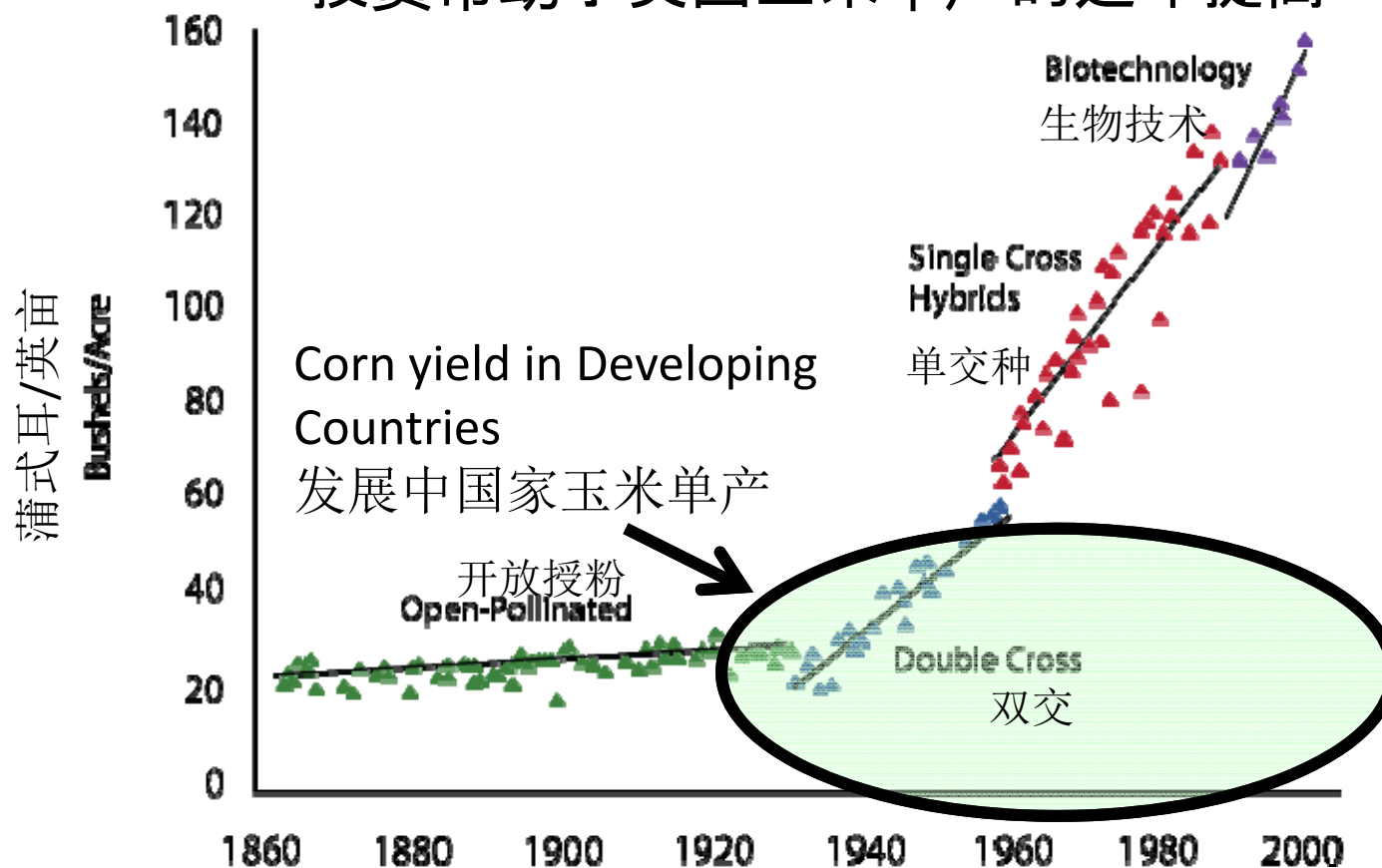
DEVELOPED 发达国家

U.S. corn for ethanol is from increased production.
美国用于生产乙醇的玉米来自于提高的产量



Investment drives annual increases in U.S. corn yields

投资带动了美国玉米单产的逐年提高



- **Corn and Sugar Yields lag in Developing Countries;**
发展中国家玉米和糖的单产很低;
- **Investment and improved agronomy are needed; &**
亟需资金投入和农艺改良;
- **Stable demand from biofuels would de-risk investment**
来自生物燃料的稳定需求会降低投资风险。

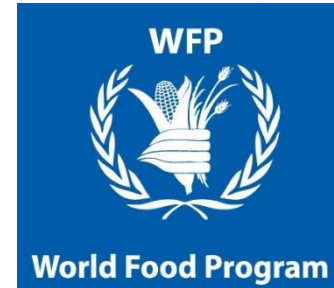
The real threat is that grain prices will drop and suppress investment in global agriculture.

真正的风险来自谷物价格下跌从而抑制全球农业投入



Extremely low food prices suppress market entry by developing country farmers forcing them to remain in the **POVERTY TRAP** of subsistence agriculture.

超低的粮食价格会抑制发展中国家农民进入市场的意愿，迫使他们陷入勉强维生的生计农业的**贫穷困境**



1. **POVERTY TRAP** 贫穷困境
2. **LACK OF INVESTMENT IN AGRICULTURE**
农业投入不足
3. **CLIMATE AND WEATHER**
气候条件和天气
4. **WAR AND DISPLACEMENT**
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5. **UNSTABLE MARKETS**
市场动荡
6. **FOOD WASTAGE** 粮食浪费

Hunger is driven by local conditions.
饥荒是当地情势导致的

For Developing Countries to NOT produce ethanol is a lost opportunity to boost global agriculture.

对于发展中国家，不生产乙醇就丧失了一次振兴全球农业的机会

- Bioenergy can **increase** food security when investment and technology improve the overall agricultural productivity and food availability.

当投资和技术改良提高了整体的农业生产率和粮食可获得性，生物能源能够提高粮食安全。

- While higher food prices can reduce food accessibility, bioenergy can **increase rural family incomes** and hence improve the ability to purchase food.

粮食价格增高虽然会增加食物成本，但生物能源能够使农业家庭的收入提高，同时也提高他们购买食物的能力。

- New **infrastructure** built to support a developing bioenergy sector, can **improve access to markets** in various industry sectors, thereby increasing overall accessibility.

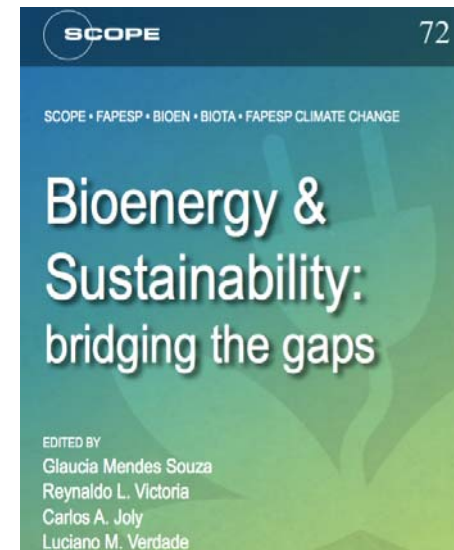
为支持发展生物能源领域进行的新的基础设施建设会带动各工业领域的市场进入，因此会增加整体可达性。

Bioenergy & Sustainability: Bridging the Gaps

2015 Scientific Committee on Problems of the Environment (SCOPE)

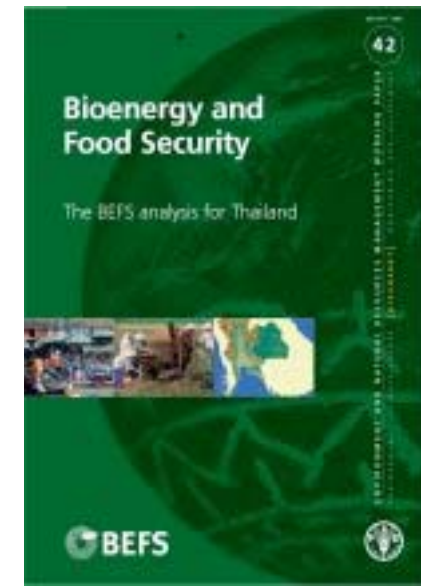
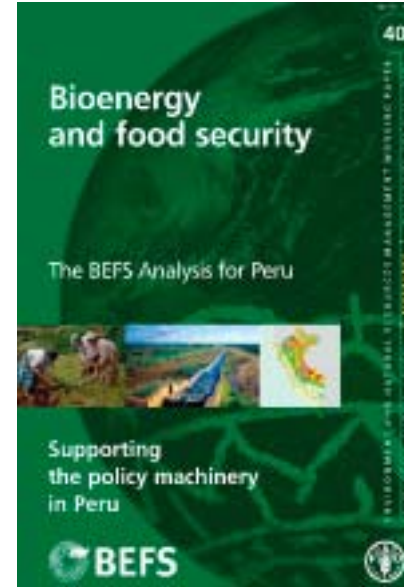
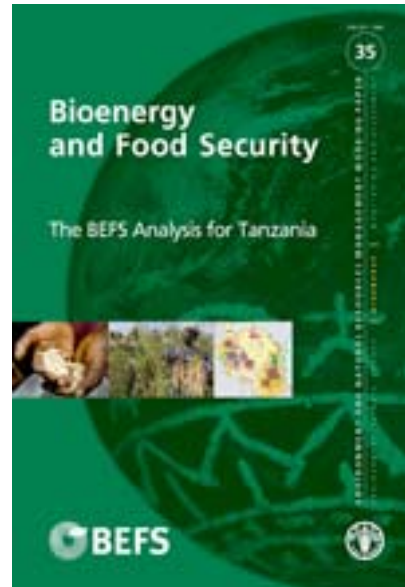
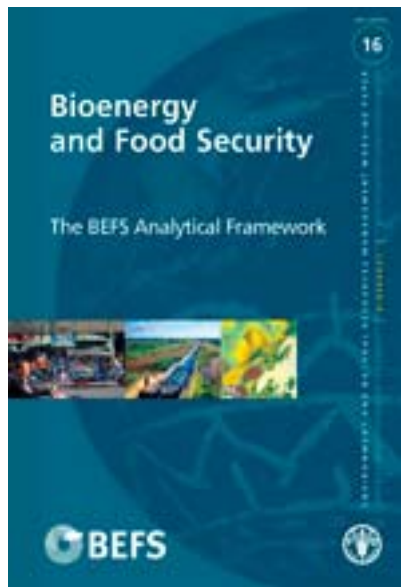
生物能源和可持续性：消除鸿沟

2015年环境问题科学委员会（SCOPE）





UN Food and Agriculture Organization studied the impact of bioenergy on food security
联合国粮农组织就生物能源对粮食安全的影响进行了多项研究



Result: Bioenergy is neither automatically good, nor automatically bad for food security - it depends on how it is produced.

结果：生物能源对于粮食安全来说既非天赐福音亦非天降横祸，而取决于如何进行生产。

The Global Bioenergy Partnership promotes the sustainable production and use of bioenergy.

全球生物能源伙伴致力于生物能源的可持续生产和利用



GBEP
Global Bioenergy Partnership

● PARTNERS 伙伴
● OBSERVERS 观察员





GBEP Timeline: 全球生物能源伙伴时间表

2005 GBEP founded to promote “the continued development and commercialisation of renewable energy ... particularly in developing countries where biomass use is prevalent”.

2005 GBEP成立，致力于“可再生能源不断地发展和商品化，尤其在生物质的利用占绝对优势的发展中国家。”

2007 GBEP creates a **Task Force on Sustainability** to develop criteria and indicators of sustainable bioenergy development.

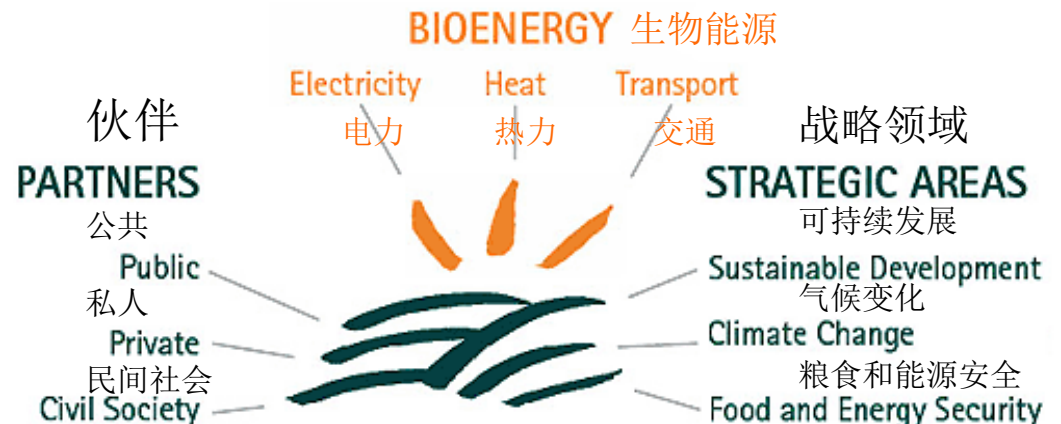
2007 GBEP成立了**可持续发展任务组**，开发可持续能源发展的标准和指标。

2011 GBEP releases Version 1 of its **Methodological Framework for GHG Lifecycle Analysis of Bioenergy**

2011年GBEP发布了第一版**生物能源温室气体全周期的分析方法框架**

2012 GBEP publicly releases report on **24 indicators of sustainable bioenergy production and use**

2012年GBEP公开发布了**可持续能源生产和利用的24项指标**的报告



GBEP developed 24 indicators of sustainable bioenergy production and use

GBEP开发了可持续能源生产和利用的24项指标

1. GBEP is the only initiative seeking to build consensus among a broad range of national governments and international institutions on the sustainability of bioenergy.

GBEP是唯一一个最先寻求广泛地在各国政府和国际机构之间就生物能源的可持续性建立共识的组织。

2. The GBEP sustainability indicators do not feature directions, thresholds or limits and do not constitute a standard; nor are they legally binding on GBEP Partners.

GBEP可持续性指标并不规定方向、阈值或限制，也不制定标准，亦对GBEP伙伴成员无法律约束性。

3. Measured over time, the indicators will show progress towards or away from a sustainable development path as determined nationally.

经过时间验证，这些指标会显示出对各国所确定的可持续发展路径接近和偏离的动向。

GBEP indicators of sustainable production and use of bioenergy provide a framework and a toolkit.

GBEP生物能源可持续性生产和利用指标提供了框架和工具包

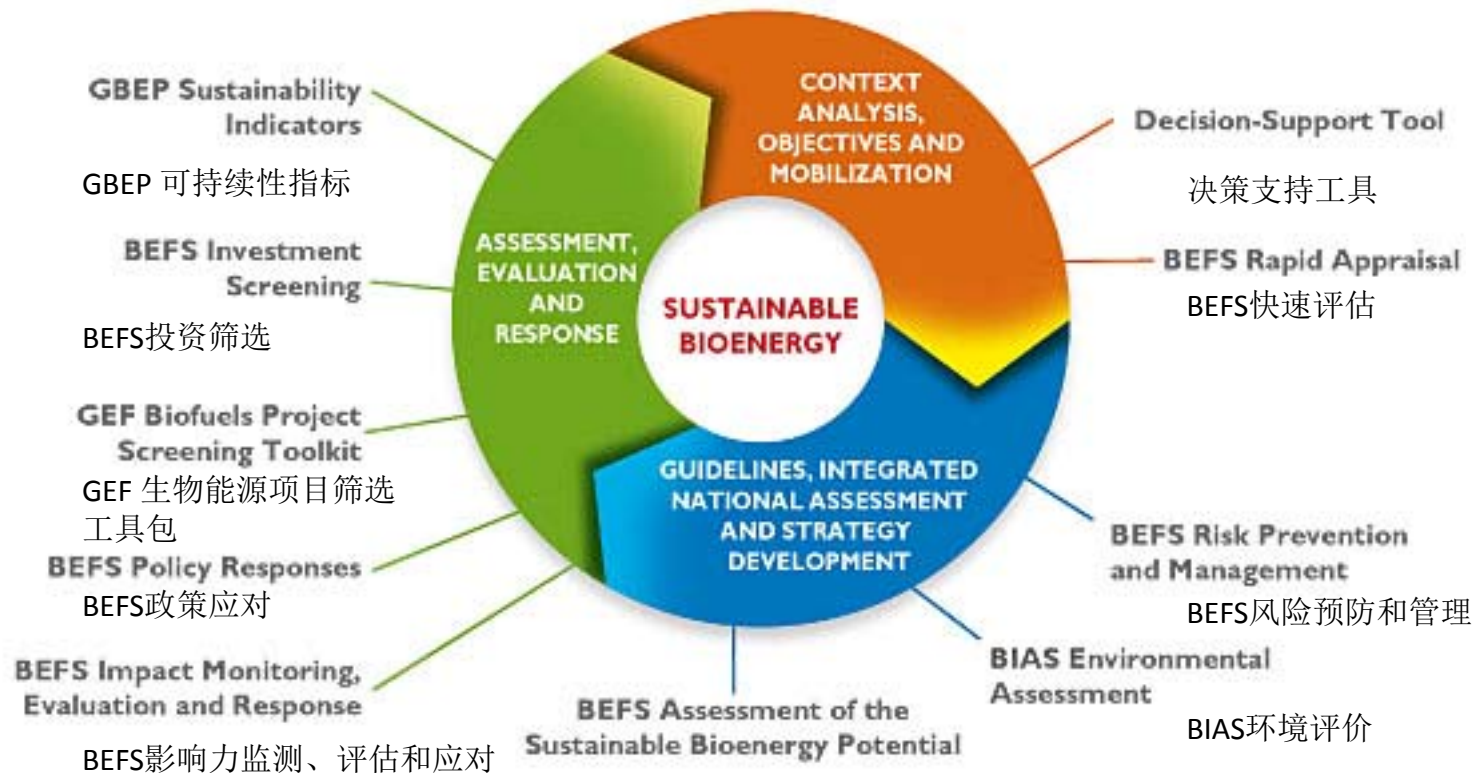
ENVIRONMENTAL 环境	SOCIAL 社会	ECONOMIC 经济
1. Life-cycle GHG emissions 全周期温室气体排放	9. Allocation of land 土地配置	17. Productivity 生产率
2. Soil quality 土壤质量	10. Price and supply of a national food basket 全国粮食一揽子价格和供应	18. Net energy balance 净能量平衡
3. Harvest levels of wood resources 森林资源的采伐水平	11. Change in income 收入变化	19. Gross value added 总增值
4. non-GHG air emissions 非温室气体空气排放	12. Jobs in the bioenergy sector 生物能源领域就业	20. Change in consumption of fossil fuels and traditional biomass 化石能源和传统生物量消费的变化
5. Water use and efficiency 水资源利用和效率	13. Unpaid time spent by women and children collecting biomass 妇女儿童无报酬采集生物量所花费时间	21. Training and re-qualification of the workforce 劳动力的培训和转产
6. Water quality 水体质量	14. Access to modern energy services 能否获得现代能源服务	22. Energy diversity 能源多样性
7. Biological diversity 生物多样性	15. Mortality and disease due to indoor smoke 室内吸烟导致的致死和致病数	23. Infrastructure and logistics for distribution of bioenergy 生物能源流通的基础设施和物流
8. Land use and land-use change 土地利用和土地利用变更情况	16. Occupational injury 职业性损伤	24. Capacity and flexibility of use of bioenergy 生物能源利用的容量和灵活性

SUSTAINABILITY SUPPORT TOOLS

可持续性支持工具

- After 2008 international agencies and groups did research and developed tools to support sustainable bioenergy production and use

2008年国际组织和机构研发了支持可持续生物能源生产和利用的工具



Key messages on bioenergy from FAO's work

粮农组织工作关于生物能源的关键信息

• **Tools are now available** to help governments and operators reduce risks and enhance opportunities of bioenergy

帮助政府和经营者在生物能源方面减少风险和增加机遇的工具已就绪。

• ***Per se* biofuels are neither good nor bad.**

What matters is the way they are managed

从本质上说，生物燃料是好是坏不能一概而论，重要的是管理的方法。

• **Small-scale bioenergy is important for rural livelihoods and not very risky**

小规模生物能源对于农村生计很重要，且风险不大



SE4All Sustainable Bioenergy Group

SE4All可持续生物能源集团

The SBG will promote

SBG 将会致力于

- Knowledge enhancement and information sharing 加强知识和信息的分享
- Policy and sustainability support 政策和可持续性支持
- Deployment support 部署方面的支持

To drive the deployment of sustainable
推进可持续发展的部署

- Increased Agricultural Productivity 提高农业生产力
- Energy from Municipal Solid Waste 从城市固体废弃物中开发能源
- Aviation Biofuels 航空生物燃料
- Low Carbon Fuels 低碳燃料





SUSTAINABLE
ENERGY FOR ALL

Leveraging International Institutions to Drive Deployment 借国际机构之力推进部署

IRENA

国际可再生能源署

World Bank

世界银行

Regional Development Banks

区域发展银行

Development Assistance

发展援助

Governments

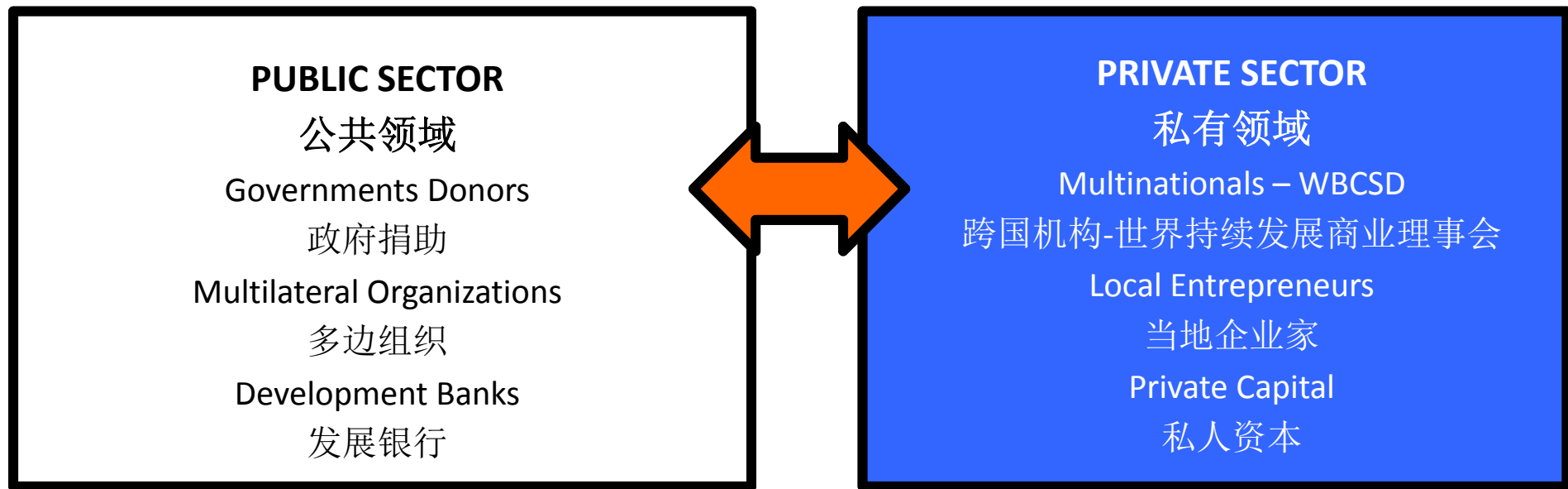
各国政府



计划区域或专项中心地点



SUSTAINABLE
ENERGY FOR ALL



Sustainable Bioenergy Group connects the Private Sector to SE4All countries and Stakeholders
可持续生物能源将私有领域与SE4All国家和利益相关者连接到一起。

The Low Carbon Fuels LCTP is deploying technologies to mitigate emissions from the transport sector.

低碳燃料LCTP开发新技术以减少交通领域的排放



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Large-scale deployment of sustainable biofuels will require joint effort between the businesses and governments.

可持续生物能源的大规模部署需要企业和政府的通力合作

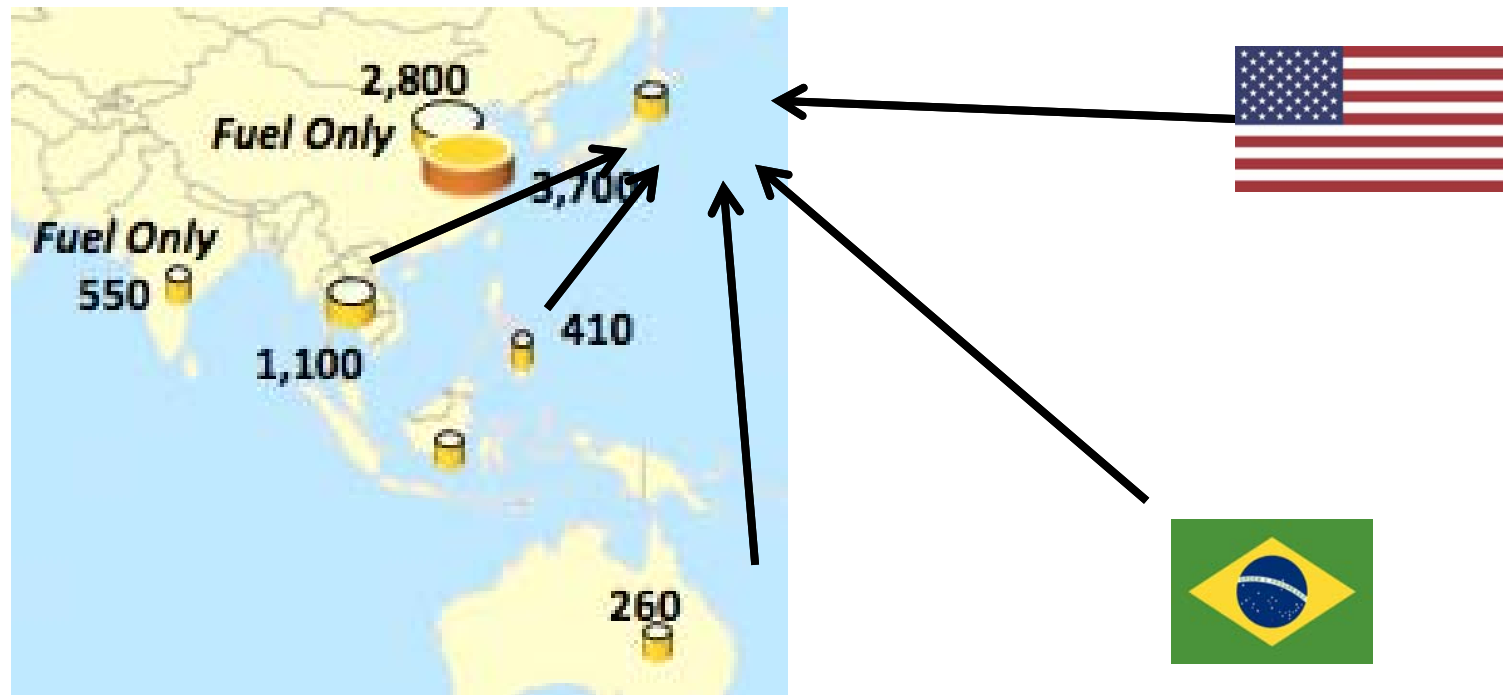


Public support for the transition to low carbon fuels should 公共部门支持向低碳燃料转型应该做到

- Increase market demand for low carbon fuels,
增加低碳燃料的市场需求
- Promote investment and support for innovation and R&D,
促成对创新和研发的投资和支持
- Provide clear standards for sustainability criteria based and reward emission reduction performance,
对可持续性的概念制定明确的标准，奖励减排行动
- Provide policy stability, including carbon pricing systems, so as to boost investor confidence.
保持政策稳定，包括碳定价系统，以提高投资者信心

Biofuels for Sustainable Development in Asia

亚洲可持续发展的生物燃料



Stable policy support for ethanol in Asia will
亚洲对乙醇的稳定政策支持将会

- De-risk regional trade in ethanol; and
降低乙醇区域贸易的风险；并且
- Increase regional investment in Agriculture.
增加对农业的区域投入。

U.S. and Brazilian ethanol can jumpstart use in the region.
美国和巴西的乙醇可在该区域的消费中抢跑。

SE4ALL Sustainable
Bioenergy Group
SE4ALL 可持续生物能源组织

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