



**Take actions on Climate  
Change Globally by Regional  
Collaboration with Technology  
and Finance**

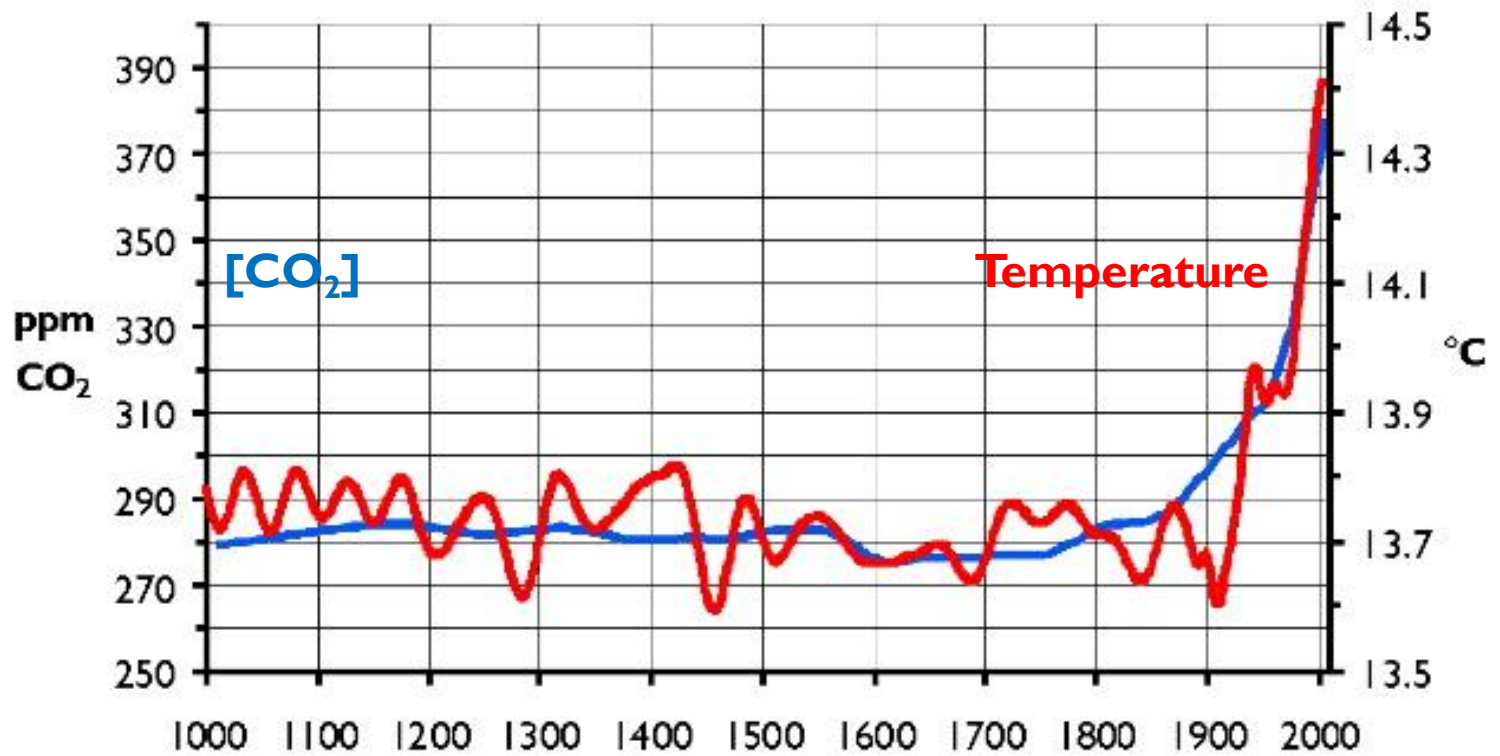
**通过区域技术和金融的合作开展  
全球气候变化的行动**

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**Los Angeles, April 8, 2013**  
**2013年4月8日**

**APBO 2013**

# Climate Change Crisis

## 对低碳项目的需求



# Climate Change Effects

## 气候变化的影响



more frequent wildfires, longer periods of drought in some regions and an increase in the number, duration and intensity of tropical storms. 更多的火灾，有些地区更长的旱情，数量和更剧烈的热带风暴

# Demand for low carbon Development

## 对低碳项目的需求



Climate Change issues can be categorized into four key areas: 气候变化的四个要素：

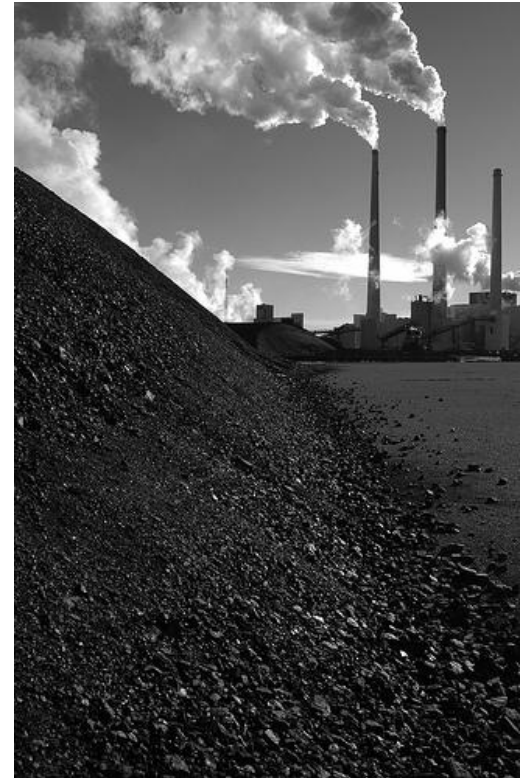
- mitigation of greenhouse gases and the pathway to low carbon economies
- 减少温室气体的排放和低碳经济的发展
- adaption in ecological, social, or economic systems to climate change
- 对气候变化的生态，社会和经济系统的适应
- the development and transfer of new technologies, 开发和新技术转移
- finance as a means to support the transition to low-carbon economies and to adapt to climate change. 对低碳转型和应对气候变化的资助。



# Demand for low carbon development in China

## 中国对低碳项目的需求

- To cut GHG per unit of GDP by 20 percent by 2010 from 2005 level (reached 19.06%); 单位GDP温室气体排放量减少20%，实际实现19.06%
- To cut energy intensity by 40 to 45 percent by 2020 from 2005 level. 到2020年，提高能效40-45%
- Low carbon development is the harmonious balance between economic growth and environmental sustainability 是经济发展与环境可持续发展的必须。



# R20 Launched in 2010

## 国际区域气候行动2010年成立



### GOVERNORS' GLOBAL CLIMATE SUMMIT 3

BUILDING THE GREEN ECONOMY  
2010 AT UC DAVIS

Co-hosted by Governor Arnold Schwarzenegger and Other Subnational Leaders

In partnership with the United Nations Development Programme & the United Nations Environment Programme

Co-sponsored by the University of California, Davis

[REGISTRATION](#)

AT THE MONDAVI CENTER AT UC DAVIS | NOVEMBER 15-16, 2010

[Home](#) | [Agenda](#) | [R20](#) | [Summit Overview](#) | [GGCS Accomplishments](#) | [Partnerships](#) | [About UC Davis](#) | [Newsroom](#) | [Travel](#) | [Exhibitors](#) | [Pre-Summit Activities](#) | [Contact](#)



Welcome to the beautiful state of California and thank you for joining us as we unite together to find productive ways to tackle the effects of climate change on our environment and our economies.

As we await negotiations on an international agreement, we as subnational leaders can and must take action now. We must work to drive green projects that both stimulate our economies and protect and preserve our most precious resources.

The United Nations Framework

#### FEATURED GUESTS AND SPEAKERS



**Prime Minister David Cameron of the United Kingdom**  
(via live satellite)



**Harrison Ford Actor and Environmentalist**

#### AGENDA HIGHLIGHTS

The GGCS 3 promises compelling climate conversations from the top leaders of local, regional, national and international entities, as well as those from academia, business and nonprofit. This summit will continue to broaden our partnerships through an increased understanding of our unique environmental and economic challenges as we continue to grow a clean, green economy. GGCS serves as a forum to learn best practices, share ideas and collaborate on projects to see first-hand how summations at the subnational level can drive

#### GOVERNOR CO-HOSTS



**Governor Jim Doyle of Wisconsin**  
United States



**Governor Jennifer M. Granholm of Michigan**  
United States



**Governor Chris Gregoire of Washington**  
United States



**Governor Ted**

# R20: Regions of Climate Action?

## R20: 国际区域气候行动?



- In 2010, Governor Schwarzenegger and other leaders of states and provinces around the world created the R20 Regions of Climate Action ([www.regions20.org](http://www.regions20.org)), a public-private partnership that brings together subnational governments; businesses; financial institutions; academic institutions; non-profit organizations; intergovernmental organizations; and United Nations programs, working towards global sustainable economy.
- 2010年，施瓦辛格州长和其它的地方领导一起创立国际区域气候行动组织（R20: [regions20.org](http://regions20.org)）。R20是一个地方政府与合作伙伴一起合作的多元联盟。R20旨在与地方政府和合作伙伴一起开发，投资，执行，评估并在全球范围内推广低碳和气候变化友好的项目，以同时实现应对气候变化的挑战和发展可持续的全球经济的双重目标。R20的合作伙伴包括金融机构，大学和科研机构，商业公司，非盈利机构和联合国的机构。



## R20 Status Update R20 最近汇报



- Over 560 states, provinces, and other regional government members & affiliates
  - 全球有560个省州以及其它区域政府的会员和合作区域
  - 50 technology & NGO partners
  - 50 多个技术和非政府机构的合作伙伴
  - 105 Green Finance Network affiliates
  - 105 个绿色金融机构的合作
- 
- 33 low-carbon economic development projects in process in 20 countries
  - 在20个国家里正在进展33个项目



# Regions in Action 区域在行动

The R20 designs, implements, & evaluates low-carbon projects within subnational governments.

R20设计，实施和评估区域政府的低碳发展项目

- **Project types: 项目的类型**
  - Renewable Energy Generation 可再生能源的生产
  - Energy Efficiency 能源效率
  - Waste Management & Waste to Energy 废物的管理和废物和能源转换
  - Fuel Switching 燃料的转换
- **In places such as...**
  - Oriental Region, Morocco 摩洛哥
  - Jiangsu, China 中国江苏
  - Delta State, Nigeria 尼日利亚
  - Gujarat State, India 印度
  - Cebu Province, Philippines 菲律宾
  - More than 560个国际区域等560个以上的国际区域





# Technologies in Action 技术在行动

The R20 compiles “toolkits” of practical low-carbon technologies and policies that can be implemented at the subnational level.

R20 编辑能够在全球地方政府实施的的低碳技术和政策的使用手册。

The R20 also assembles expert technology teams that can be deployed to R20 Member regions to help with project implementation. R20同时组织国际一流的技术专家团队帮助全球各地的低碳项目的实施

- **Technical Toolkits:** Cool Roofs, LED lighting, Renewable Energy, Waste to Energy, etc. 技术手册包括：清凉屋顶，LED照明，可再生能源，废物转能源等等。
- **Subnational MRV Project:** Helping subnational governments consistently and accurately measure and report their GHG emissions 帮助地方政府实现项目的可测量性





# Finance in Action 金融在行动

The R20 facilitates investments in low-carbon economic development projects within subnational governments through its robust network of public and private investors.

R20通过有力的公私的金融网络帮助地方政府低碳项目的投融资。

This will be coordinated and managed by R20's Green Finance Network.

这些都由R20的绿色金融网络来实现。

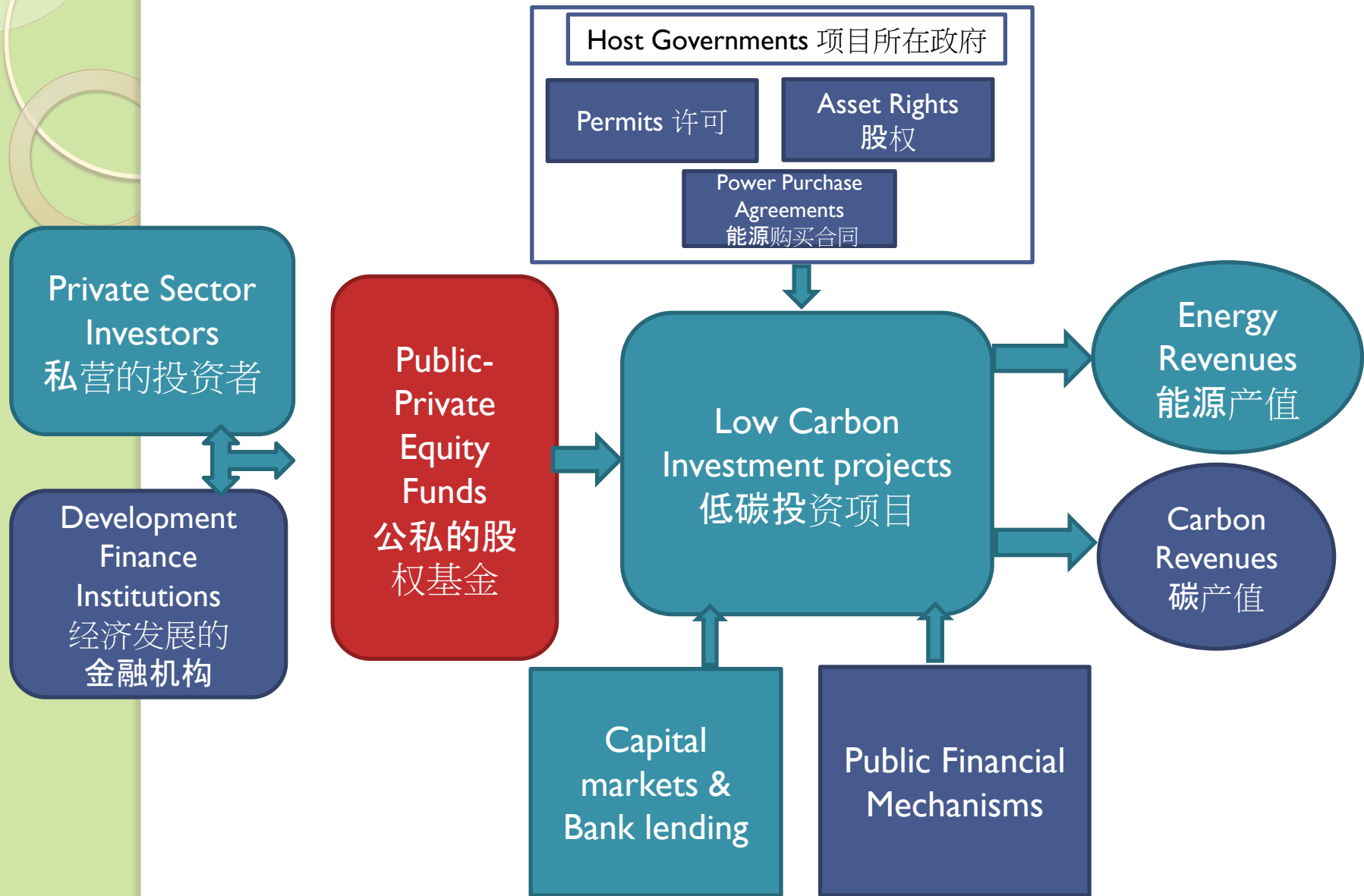
- The R20 works as a “matchmaker” for subnational governments, technology providers, and investors.

R20 作为全球的区域政府，技术提供商和投资者的联系纽带

- **Green Finance Network launched in March (105 now) !**
- **2012年3月，R20的绿色金融网络正式成立**



# R20 Project Sourcing and Financing: Depiction R20 项目和金融的剖析





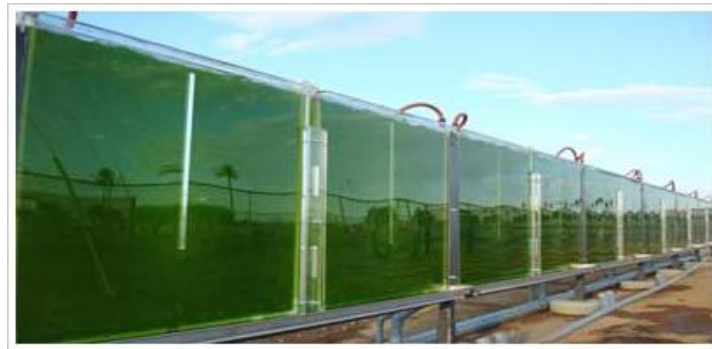
# R20 Green Finance Network: Selected Highlights

## R20 绿色金融网络：精选

Sovereign Wealth Funds 主权财富基金	Pension Funds 抚恤基金	Endowments 捐款基金	Private Equity Infrastructure 私募/基建基金	Banks 银行
<ul style="list-style-type: none"> <li>- Abu Dhabi IA</li> <li>- Bahrain EDB</li> <li>- China Inv. Corp</li> <li>- Mubadala Capital</li> <li>- Mumtalakat Bahrain</li> <li>- Qatar NFSP</li> <li>- Temasek Singapore</li> <li>- ATP Denmark</li> </ul>	<ul style="list-style-type: none"> <li>- CalPERS</li> <li>- British Columbia IMC</li> <li>- Invest Victoria</li> <li>- Fonds de Solidarité</li> <li>- Caisse de Depot</li> <li>- Credit Agricole</li> </ul>	<ul style="list-style-type: none"> <li>- Doen Fdn.</li> <li>- Calvert Fdn.</li> <li>- Ford Fdn.</li> <li>- Rockefeller Brothers Fund</li> <li>- Impact Capital</li> <li>- Confluence Philanthropy</li> <li>- Hewlett Fdn</li> </ul>	<ul style="list-style-type: none"> <li>- Pegasus Capital Infrastructure Finance Corp.</li> <li>- Sustainable Development Capital</li> <li>- Macquarie Capital</li> <li>- SUSI Partners</li> <li>- Goldman Sachs</li> <li>- HSBC</li> <li>- A-Global</li> </ul>	<ul style="list-style-type: none"> <li>- Asian DevBank</li> <li>- World Bank</li> <li>- African Dev Bank</li> <li>- E. de Rothschild Group</li> <li>- Raymond James Group</li> <li>- EU Inv. Bank</li> <li>- UNEP-FI</li> <li>- Wells Fargo</li> <li>- EastWest Bank</li> <li>- Huaxia Bank</li> </ul>

# R20 Technology: Biofuel to Aviation

## R20 技术：航空生物燃油

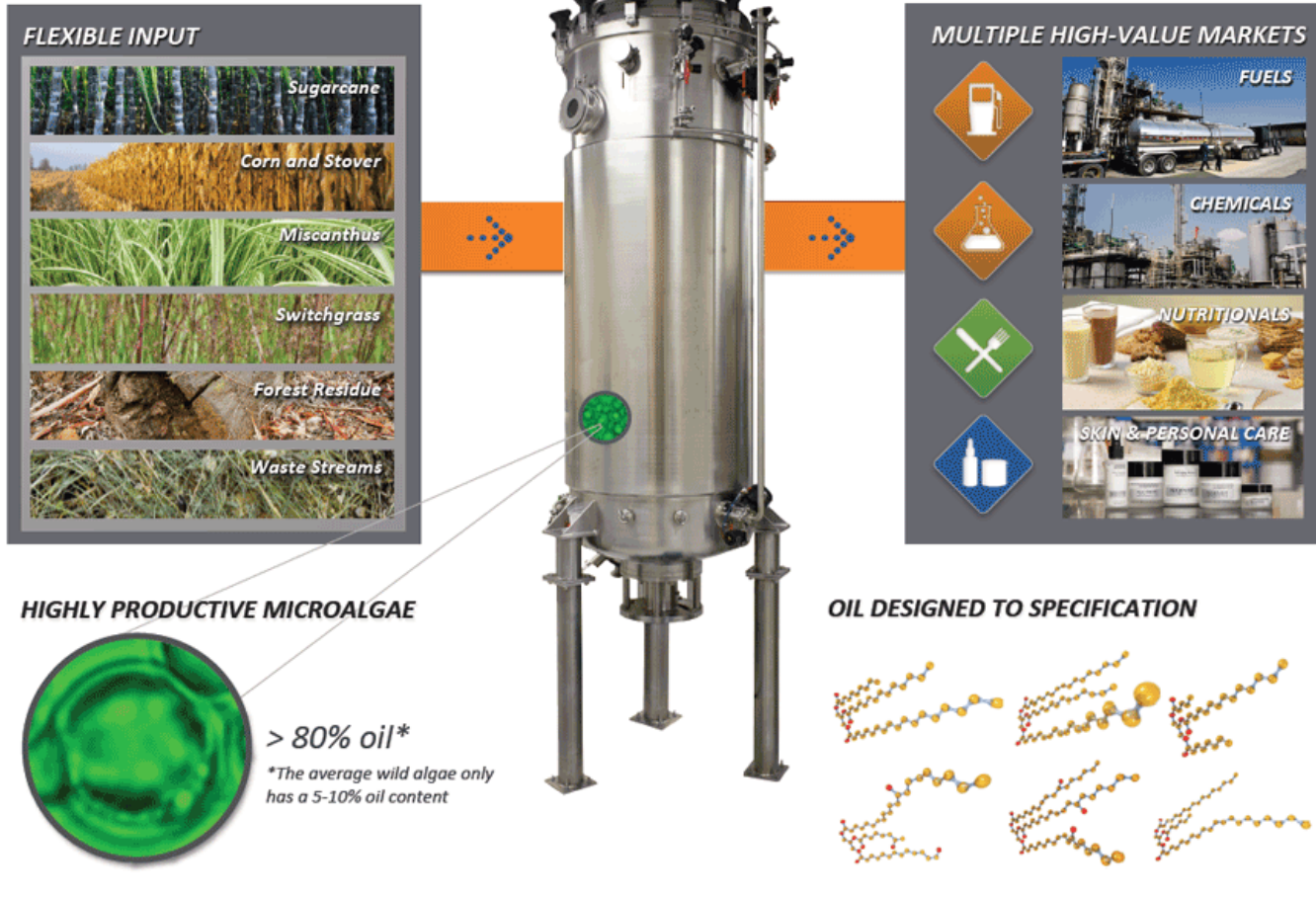


- biomass to low-carbon Aviation fuel.
- 将生物质转成低碳航空燃油。

# R20 Technology: Biofuel to Aviation

## R20 技术：航空生物燃油

### BREAKTHROUGH BIOTECHNOLOGY PLATFORM



# R20 Technology: Waste Conversion Overview

## R20 技术：废物转换的技术



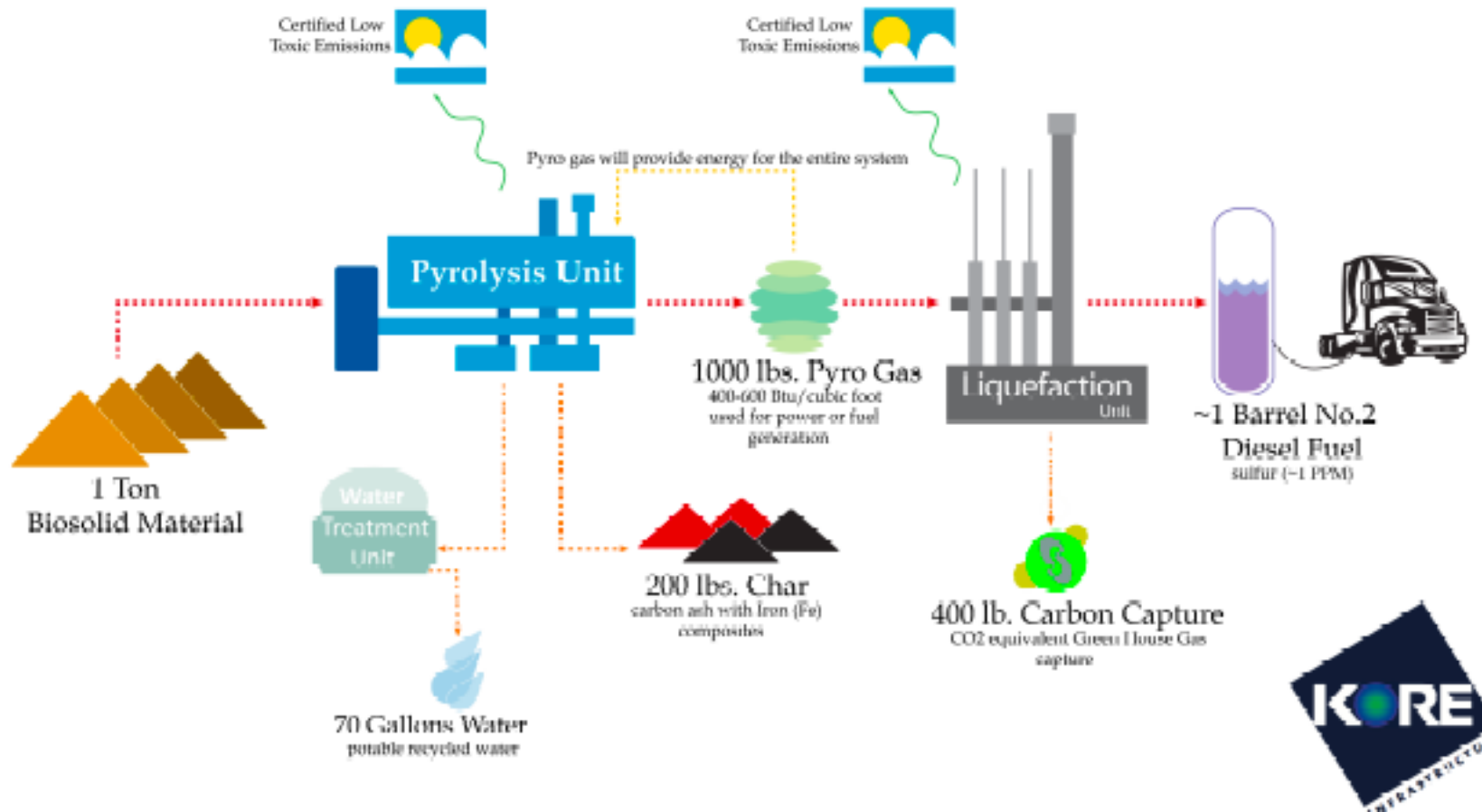
- Convert sewage sludge or waste tires to low-carbon diesel fuel.
- 将污泥或废轮胎转成低碳柴油燃料。
- Systems are modular, scalable, and operate from energy created by the conversion process.
- 系统的模块化，可大幅度推广，并利用系统产生的能量进行生产。
- Los Angeles, California project available for site visit now.
- 洛杉矶的基地已经可供参观。
- R20 Green Finance Network financing model for new projects around the world, including unique insurance process guarantee.
- R20 绿色金融融资模式为该项目在世界各地发展提供资助和独特的保险保障。



# R20 Technology: Waste Conversion Process

## R20 技术：废物转换的流程

### KORE Infrastructure Process Flow Diagram



# R20 Technology: LED Streetlight Overview

## R20 技术：LED路灯的概述



- Better visibility and illumination of LED over traditional lighting improves safety for drivers and pedestrians.
- LED路灯有比传统光源更好的分辨率和照度，因此提高司机和行人的安全性。
- Reduced energy, maintenance, and disposal costs.
- 减少能源，维护，和处理费用。
- In R20 Brazil, retrofits repaid in under 2 years by savings.
- 在R20 巴西，替换工程2年内收回成本。

# R20 Technology: LED Streetlight Example

## R20 技术：LED路灯例子

	Typical “cobrahead” streetlight 典型的蛇头型路灯	Typical LED Roadway Light 典型的LED巷道路灯
Wattage 瓦数	129	55
Annual Energy Cost 每年能源耗费	\$45	\$19
Lamp Life Hrs. 灯的寿命	15,000	60,000+
Annual Maintenance Cost 年维持费用	\$35	0
Annual Savings 每年的节省	0	<b>\$61 USD</b> (\$.08 KWH, 12 Hrs Per day)
Lifetime Savings 生命周期节省	<b>0</b>	<b>\$835 USD</b>

# R20 Technology: Solar Thermal

## R20技术：太阳热能



- R20 Partner Westech
- R20 的合作伙伴， Westech
- Unique solar water heating system
- 独特的太阳能光热系统。
- R20 will promote adoption of technology in Greenville, Texas “Solar City” and worldwide
- R20 将促进该技术在德克萨斯Greenville太阳城和全球的使用。



# R20 Cool Roofs Toolkit

## R20 清凉屋顶的工具手册

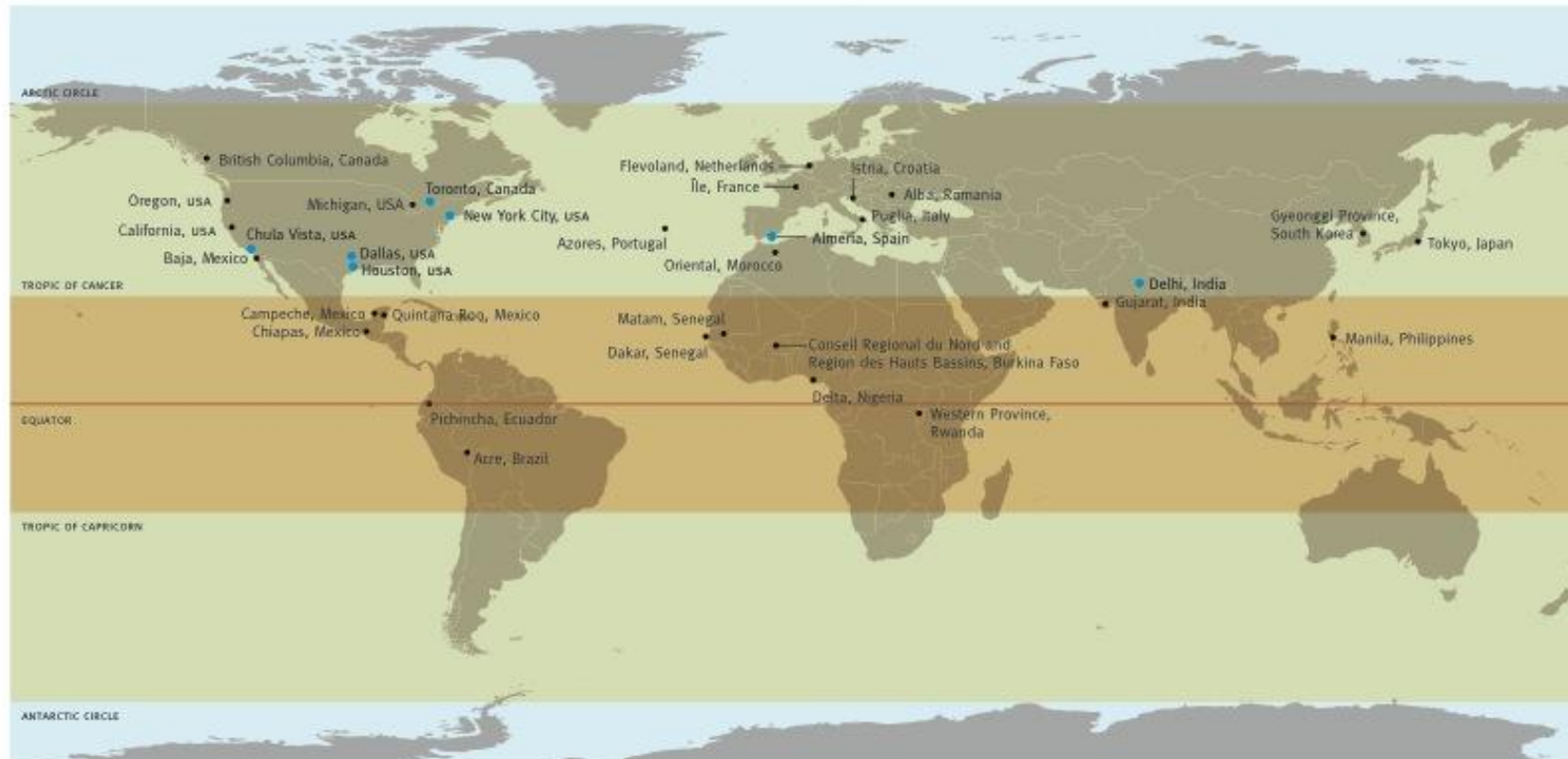
### Climate Factors

Cool roofs and cool pavements are beneficial for most buildings and road surfaces almost everywhere in the world, although their cost-effectiveness can vary significantly, depending on climate and local factors. The specific benefits that accrue to individual buildings, individual cities, and the planet can also vary greatly depending on building type, climate zone, topography, and weather patterns of the region. Simulations with local conditions can

identify the benefits of deploying cool roofs in a particular location. The map below shows global climate zones. Cities and regions in tropical zones have long hot seasons where the benefits of cool roofs and pavements are clear. Cool surfaces deployed in temperate climate zones, characterized by shorter hot seasons, will very often result in net benefits as well—even when evaluating only the net energy cost savings.

World map showing R20 member cities and regions, as well as the locations of case studies throughout this guide. The temperate and tropical regions of the world as commonly defined are indicated. Please note that not all temperate regions will be favorable for cool roof and pavement deployments. Sources: Adapted from NASA Surface Meteorology and Solar Energy maps.

- R20 member cities and regions
- Case Studies in this guide
- Arctic zones
- Temperate zone
- Tropical zone



# R20 Cooler Communities

## R20 清凉社区

### Strategies

策略

Cooler Roofs  
Shade Trees

清凉屋顶  
树荫

Cooler Roofs  
Cooler Pavements  
All Vegetation

清凉屋顶，清凉路面  
各种植被覆盖

### Processes

过程

直接  
Direct

Reduces  
A/C Use

减少空调的使用

Reduces  
Demand at  
Power Plants

减少对发电量的需求

Indirect

间接

Reduces  
Outdoor  
Temps

降低室外气温

Area  
Sources  
Emit Less

单位面积减排

Slows  
Reaction  
Rates

减少反应的速度

### Results

效果

Less  
Energy  
Consumed

减少能源耗费

Lower CO<sub>2</sub>,  
NO<sub>x</sub>, and  
VOC Levels

降低CO<sub>2</sub>等的浓度

Lower  
Ozone  
Levels

降低臭氧的浓度

# R20's Practical "How to" Guide

## R20 的实用的“如何”指导



**Global Cool Cities Alliance (GCCA)** works with cities, regions, and other stakeholders to accelerate a worldwide transition to highly reflective, cooler, healthier cities. Its mission is to advance policies and programs that increase the solar reflectance of our buildings and paved surfaces to promote cool buildings and cool cities, and to mitigate the effects of climate change through global cooling. GCCA pursues this mission through program areas that, together, are designed to ensure that a range of mechanisms, from municipal action to advancements in research and development, act in concert to accelerate the adoption of cool surfaces.  
[globalcoolcities.org](http://globalcoolcities.org)



### **R20 Regions of Climate Action**

The mission of the R20 is to help states, provinces, regions, and other subnational governments around the world develop, implement, and communicate low-carbon and climate-resilient economic development projects, policies, and best practices.

The R20's low-carbon projects will produce global environmental benefits as well as local economic benefits in the form of reduced energy consumption and greenhouse gas emissions, enhanced local economies, new green jobs, improved public health, and increased climate resilience. The R20's projects will be developed and implemented by a diverse coalition of subnational governments and partners (non-profit organizations, corporations, academic institutions, intergovernmental organizations, financial institutions, United Nations programmes, and national governments.)

GCCA is a non-profit partner to the R20 and is the technical advisor on its cool roof and pavement initiative.  
[regions20.org](http://regions20.org)

Get updates at  
[coolrooftoolkit.org](http://coolrooftoolkit.org)

We'll help you.

Visit [www.coolrooftoolkit.org](http://www.coolrooftoolkit.org)

# R20 China Project Development

## R20 中国项目的发展

The R20 is actively developing low carbon projects in the following regions/cities

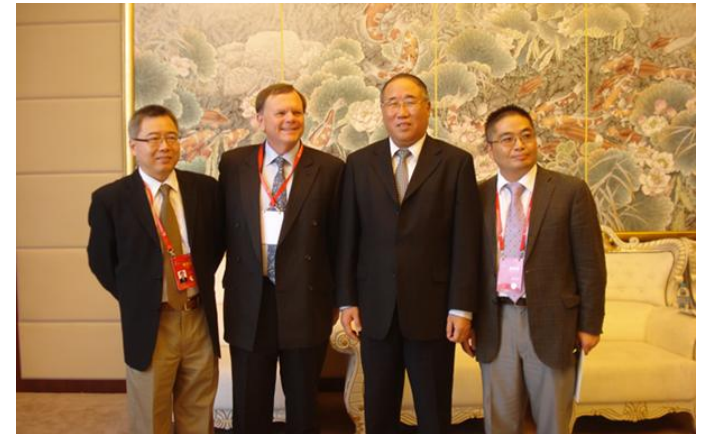
R20 在中国如下区域开展低碳项目的开发:

- Beijing 北京
- Jiangsu Province (Wuxi and Nanjing) 江苏省（无锡和南京）
- Chongqing（重庆市）
- Guangdong Province (Shenzhen) 广东省（深圳）
- Hubei Province (湖北省)
- Liaoning Province (Shenyang and Dalian) 辽宁省（沈阳和大连）
- Shandong Province (Qingdao City) 山东省（青岛）



# R20 Goals in Asia R20 亚洲的目标

- Identify Asian low carbon technology companies to promote worldwide.
- 选择亚洲低碳技术公司在全球范围内推广。
- Bring world leading low carbon global technologies for deployment in Asia.
- 将全球领先的低碳技术引入到亚洲并使用。
- Demonstrate low carbon policies, such as cool roof applications.
- 展示低碳策略，如清凉屋顶的使用。
- Create R20 Technology Exchange Communities: Tianjin, China; Greenville, Texas; Cidade do Povo, Brazil; Masdar, UAE
- 建立R20 技术交换社区：中国天津，美国德州Greenville，巴西Cidade do Povo，阿联酋的马斯达。
- Identify low carbon development projects in China where R20 can add value: 找出中国的一些低碳发展项目，R20可以贡献力量：
  - New technology
  - 新技术
  - Policy recommendations for success
  - 能够加速成功的政策建议
  - Finance
  - 金融





# Recent Events 最近的活动

- **Feb., 2012:** Delhi Trade Mission – Delhi Sustainable Development Summit  
2012年2月印度德里可持续发展峰会
- **Mar., 2012:** Geneva – Governing Board, General Assembly, Pre-Rio Workshop  
2012年3月R20董事大会
- **Jun, 2012:** Brazil Trade Mission  
– UN Rio +20 Conference,  
China trip with R20 Partners  
and NDRC delegation to  
subnational regions in China  
2012年6月巴西里约会议；R20代表团和国家发改委代表团访问中国
- **Nov., 2012:** Wuxi-Joint with China (Wuxi) Renewable Energy Conference  
2012年11月R20与中国（无锡）新能源大会合作的R20国际低碳行动
- **Feb., 2013:** R20 Vienna conference: Implementing the Sustainable Energy Future  
2013年2月：R20维也纳论坛：实现可持续发展的未来



# Contact Information



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