

**ASIA PACIFIC ECONOMIC COOPERATION (APEC)
NEW AND RENEWABLE ENERGY TECHNOLOGIES EXPERT GROUP (EGNRET) MEETING
FORTIETH MEETING**

**Current status and development for grid
integration of small scale RE electricity in China**

**Mr. Lin WAN
Ha Noi, Viet Nam, April, 2013**

Content



1. China's Renewable Energy Development
2. Opportunity & Challenge
3. Cooperation Proposal



Power Source Structure in China, 2011



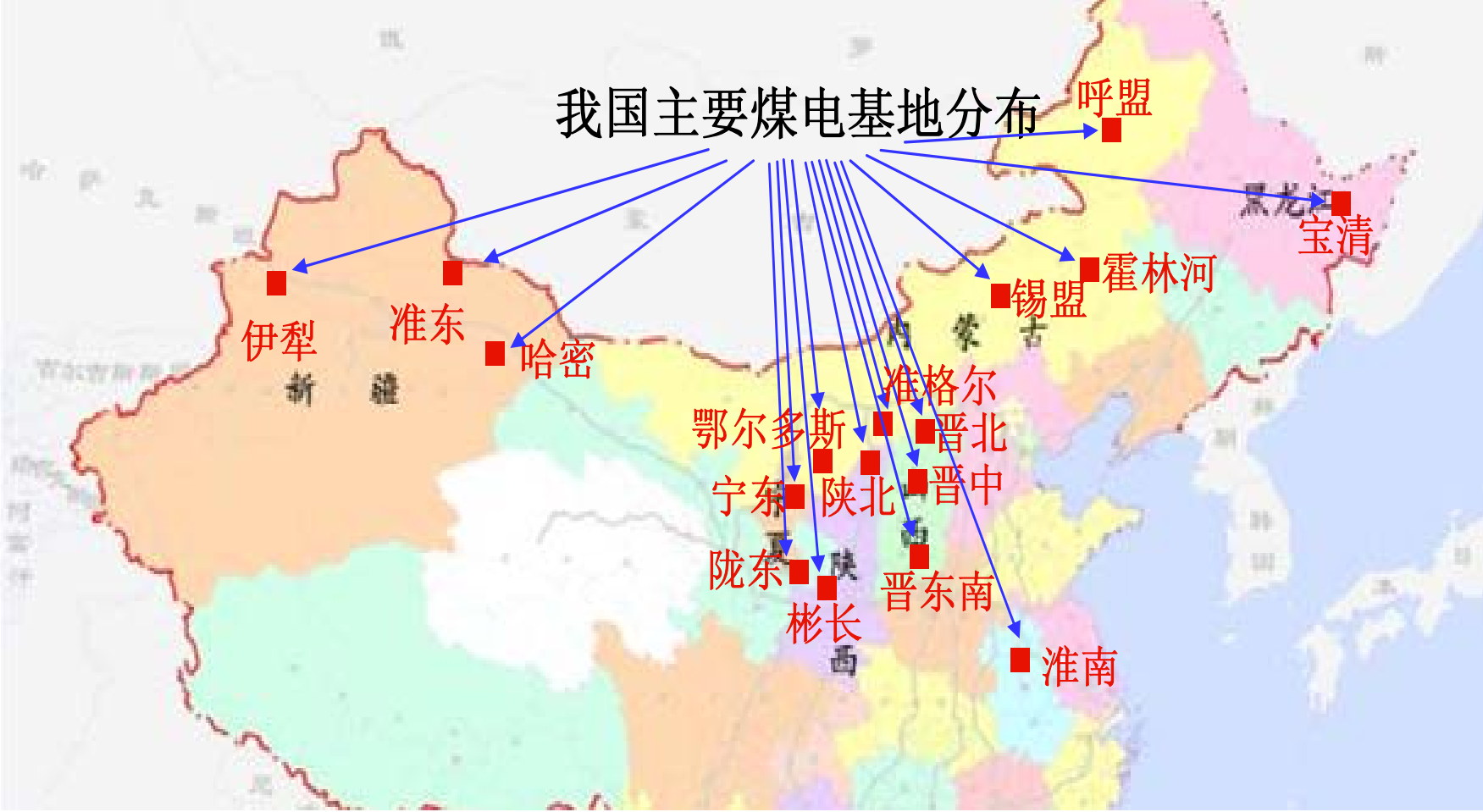
2011年电力装机和发电量 Power Source Structure in 2011				
类型 Type	装机容量 (GW) Capacity		发电量 (TWh) Generation	
	容量	比例	发电量	比例
	(GW)	(%)	(TWh)	(%)
煤电 Coal	765.46	72.5	3897.5	82.54
水电 Hydro	230.51	21.83	662.6	14.03
核电等 Nuclear etc	15.65	1.48	87.4	1.85
风电 Wind	42	3.98	73.2	1.55
光伏 PV	2.14	0.2	1	0.02
合计 Total	1055.76	100.00	4721.7	100.0

Power Source Structure in China, 2020



2020年电力装机和发电量 Power Structure by 2020				
类型 Type	装机容量 Capacity (GW)		发电量 Generation (TWh)	
	容量	比例	发电量	比例
	(GW)	(%)	(TWh)	(%)
煤电 Coal	1170	60.47	6100	72.27
水电 Hydro	360	18.6	1200	14.22
核电等 Nuclear etc	130	6.71	590	6.99
风电 Wind	180	9.3	360	4.27
太阳能 PV	50.00	2.58	75	0.89
其它 Others	45	2.33	115	1.36
合计 Total	1935	100	8440	100

Coal Base in China, 2020



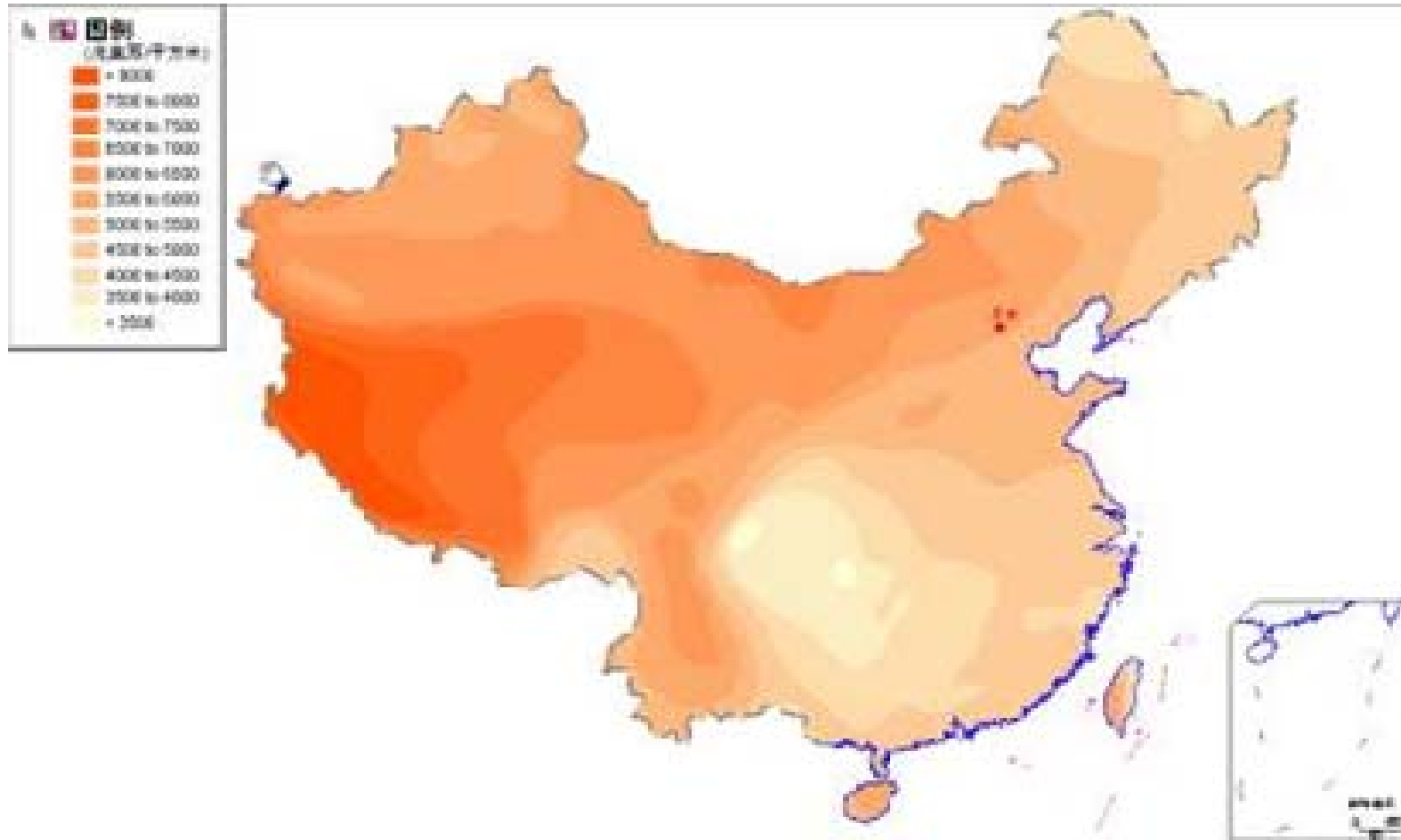
Hydro Power in China



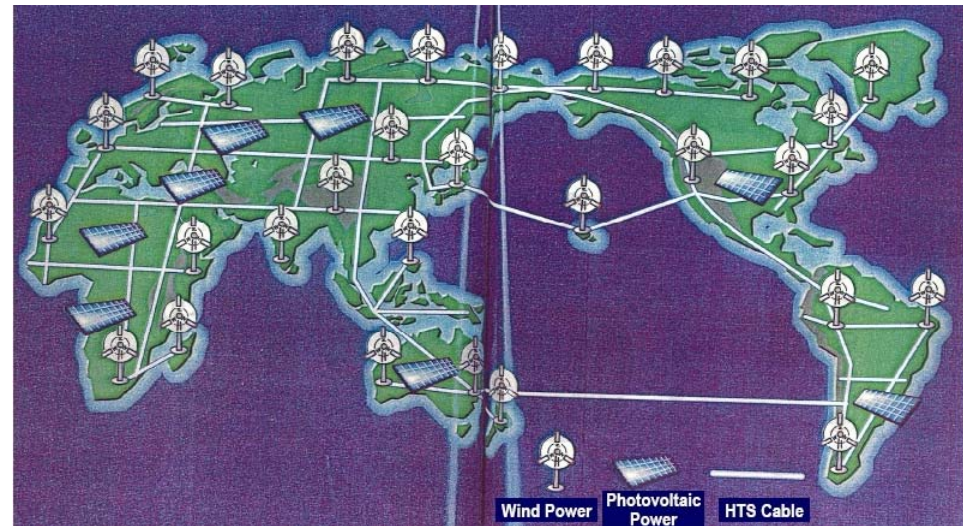
Wind Power in China



Solar Resources in China



Super Grid & Distributed Energy



2. Opportunity & Challenge in China



- Opportunity
 - Resources
 - Laboratory
 - Market
- Challenge
 - Technology: Reliability of PV System
 - Economy: Safety, Profitability, Liquidity of PV Investment
 - Social: Mature Industry?



RE in China: still a Baby Industry



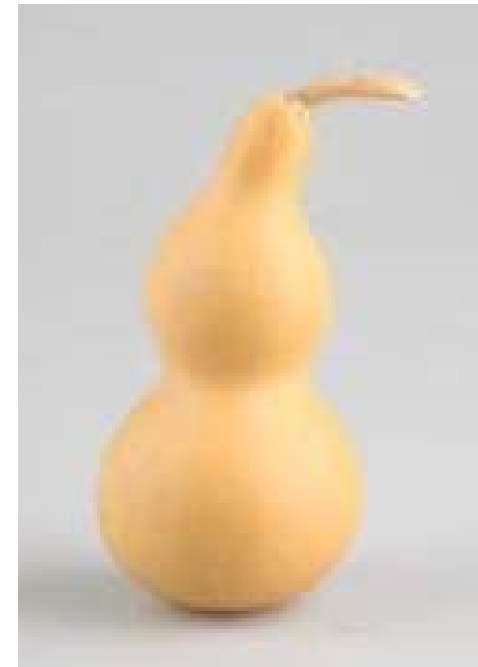
- Technology Innovation
 - Renewable energy, like PV
 - Traditional
 - IT
- Business Model Innovation
- Financing Innovation
- Policy Innovation
 - Subsidy
 - Insurance
 - Guarantee



Like a Gourd



- Where is PV Market ???
- Bottle Neck: Project Pool
- Possible choices, Innovation of Application:
 - Industry Zone
 - Agriculture
 - Residential
 - Fishing
 - Metallurgy
 - Railway
 - Highway
 - port, etc



From Luxury to economic energy



- Large scale, professional
- Reduce of Cost
 - Manufacturing
 - Construction
 - O&M
 - Administration
 - Grid connection
 - Electricity Sales
 - Land, Taxation, etc



First Wave of RE Development



- Pushed by global fiscal subsidy and support
- Leading role: Manufacture, especially PV Module
- Main character and achievement
 - Large Scale
 - Lower Cost
 - Fast Speed



Second Wave of RE



- Pushed by: Grid Parity
- Leading Role: System Solution provider, Developer
- Five Characters
 - Innovation of Application
 - Quality & Risk Management, Evaluation System
 - Insurance: Yield Index & Revenue Insurance
 - Investment: Professional, Long-term Investor
 - Second hand market and Quit Scheme



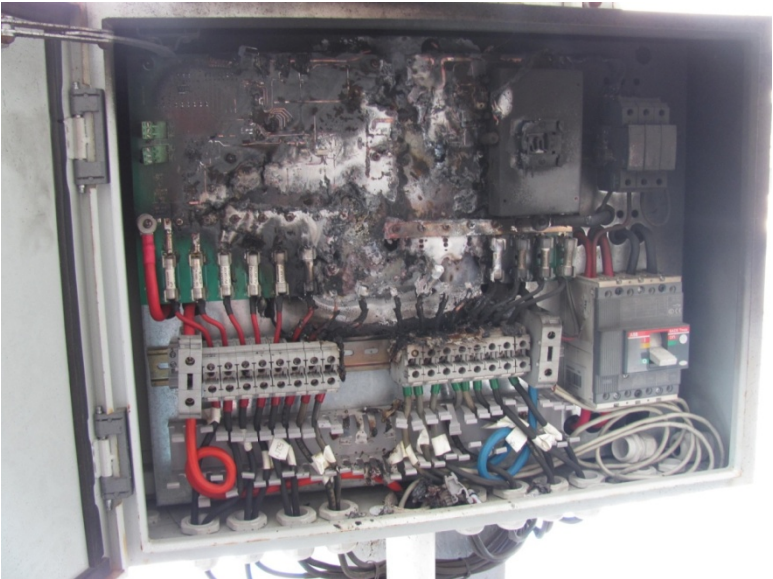
Third Wave of RE



- Pushed by: urbanization
- 100 Low Carbon Model Town
- Risk of Carbon Tsunami, Global Carbon Taxation could bring the third wave of PV development



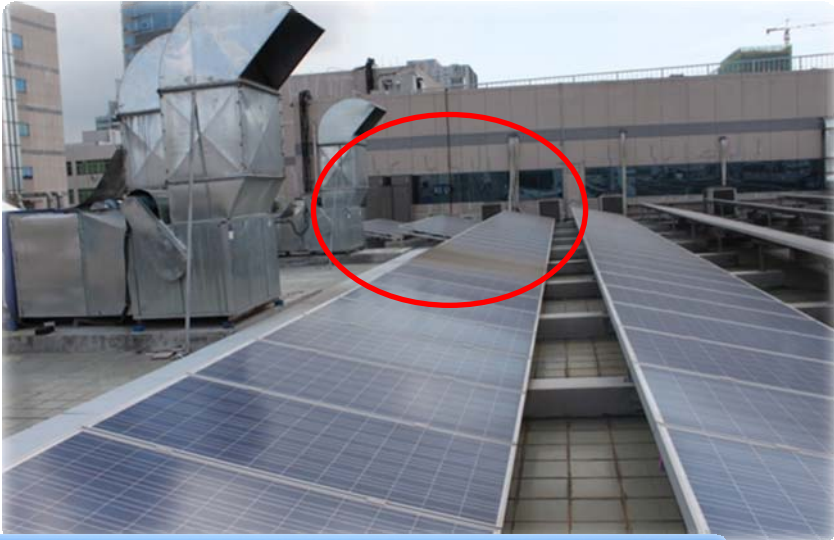
Risk & Casualty



Risk & Casualty



Risk & Casualty



Risk & Casualty



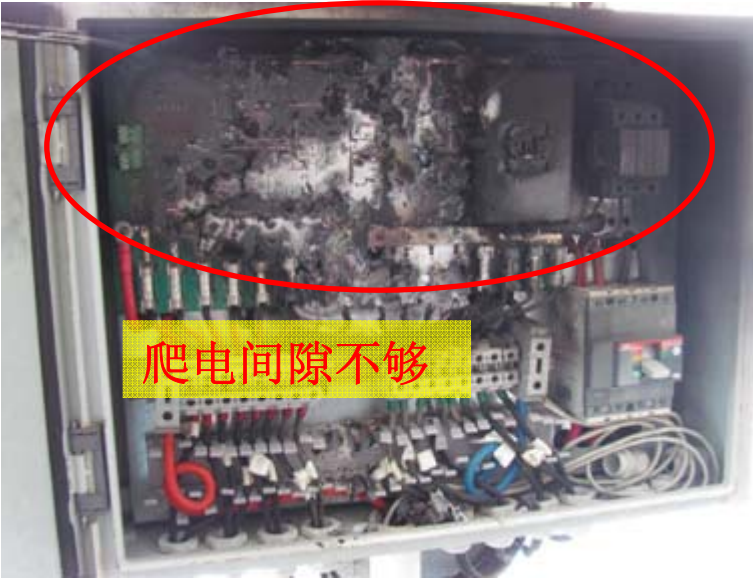
未考虑回填土的影响，半年后出现沉降，呈现“波浪”



这样的电站一看就知道是没有设计院参与



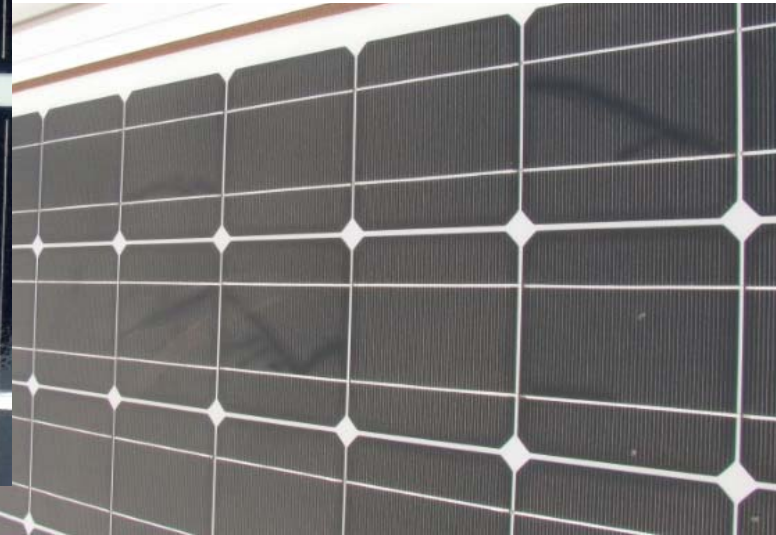
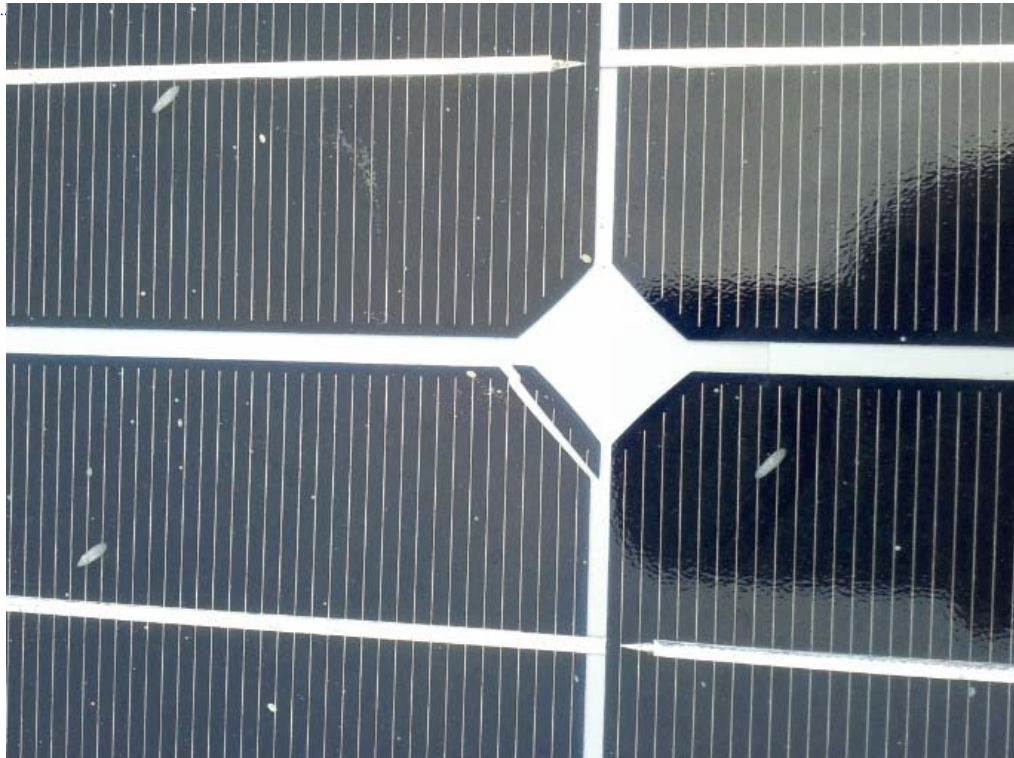
Risk & Casualty



Risk & Casualty



Risk & Casualty



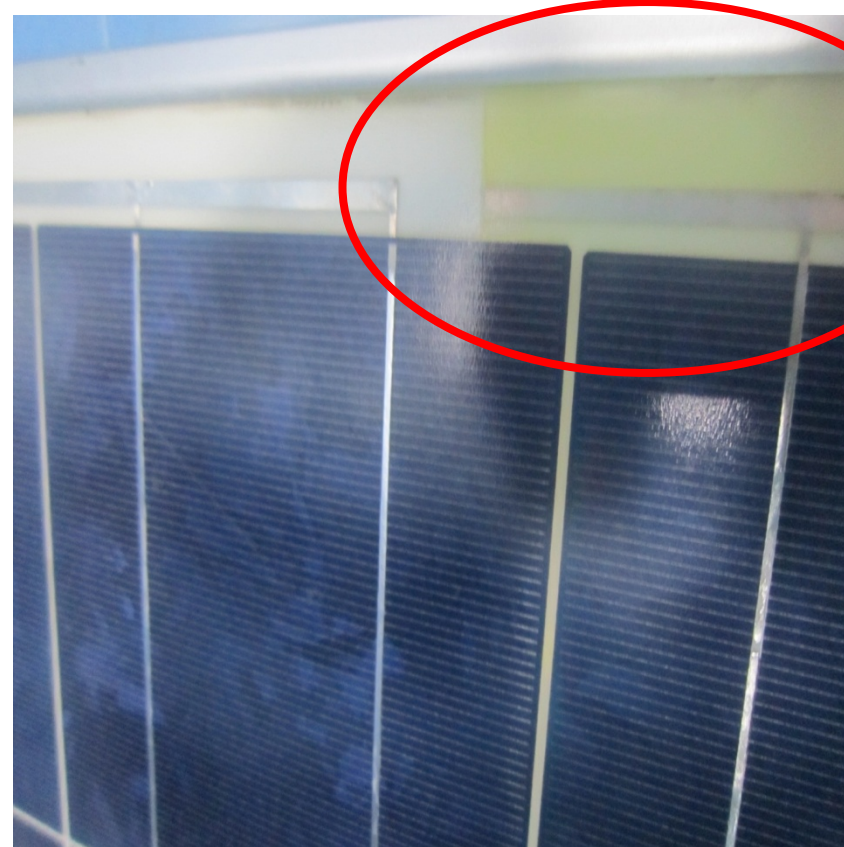
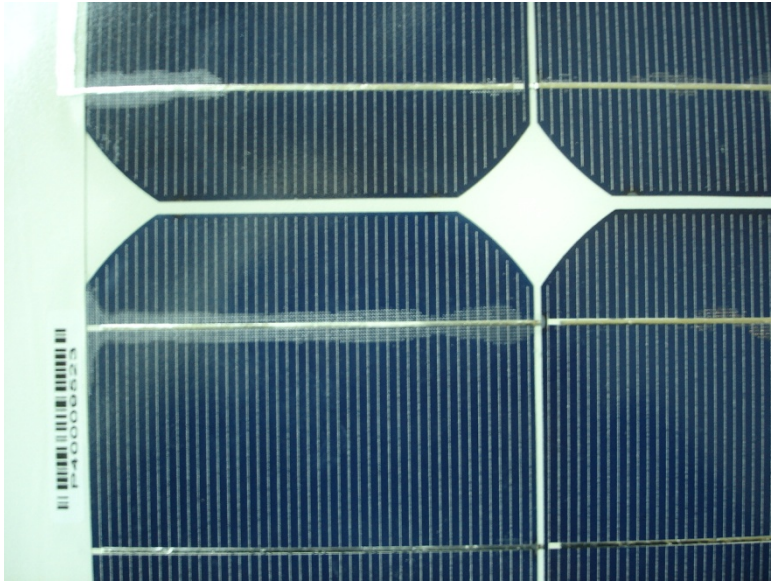
Risk & Casualty



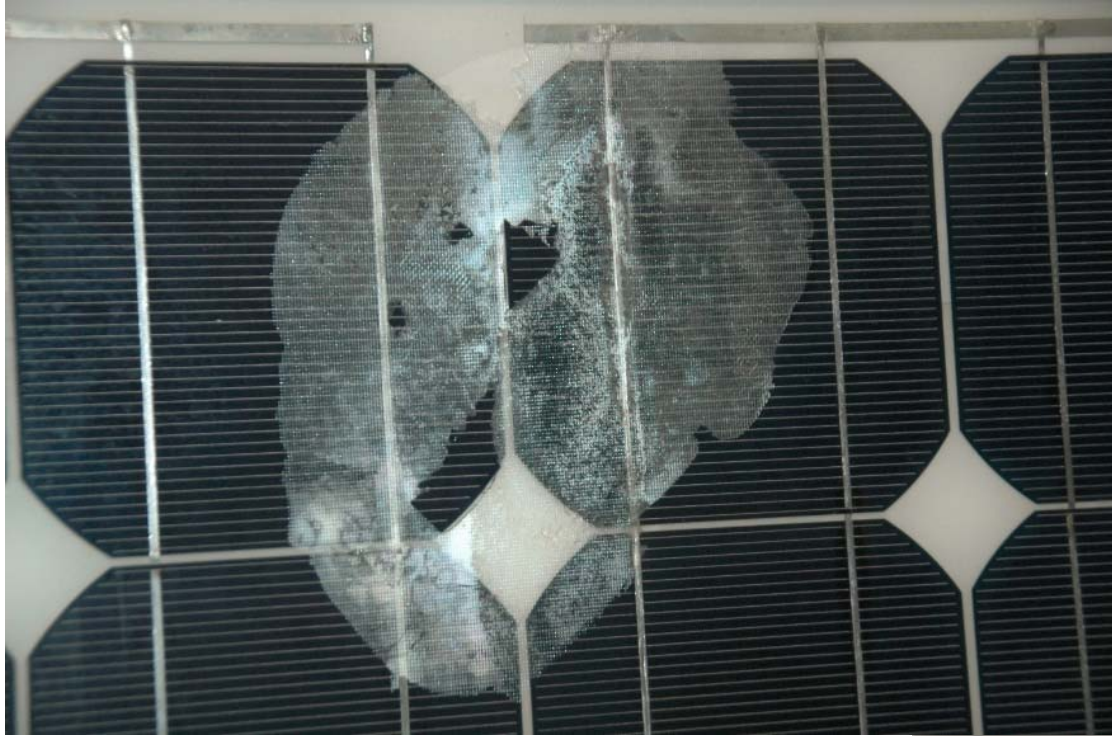
Risk & Casualty



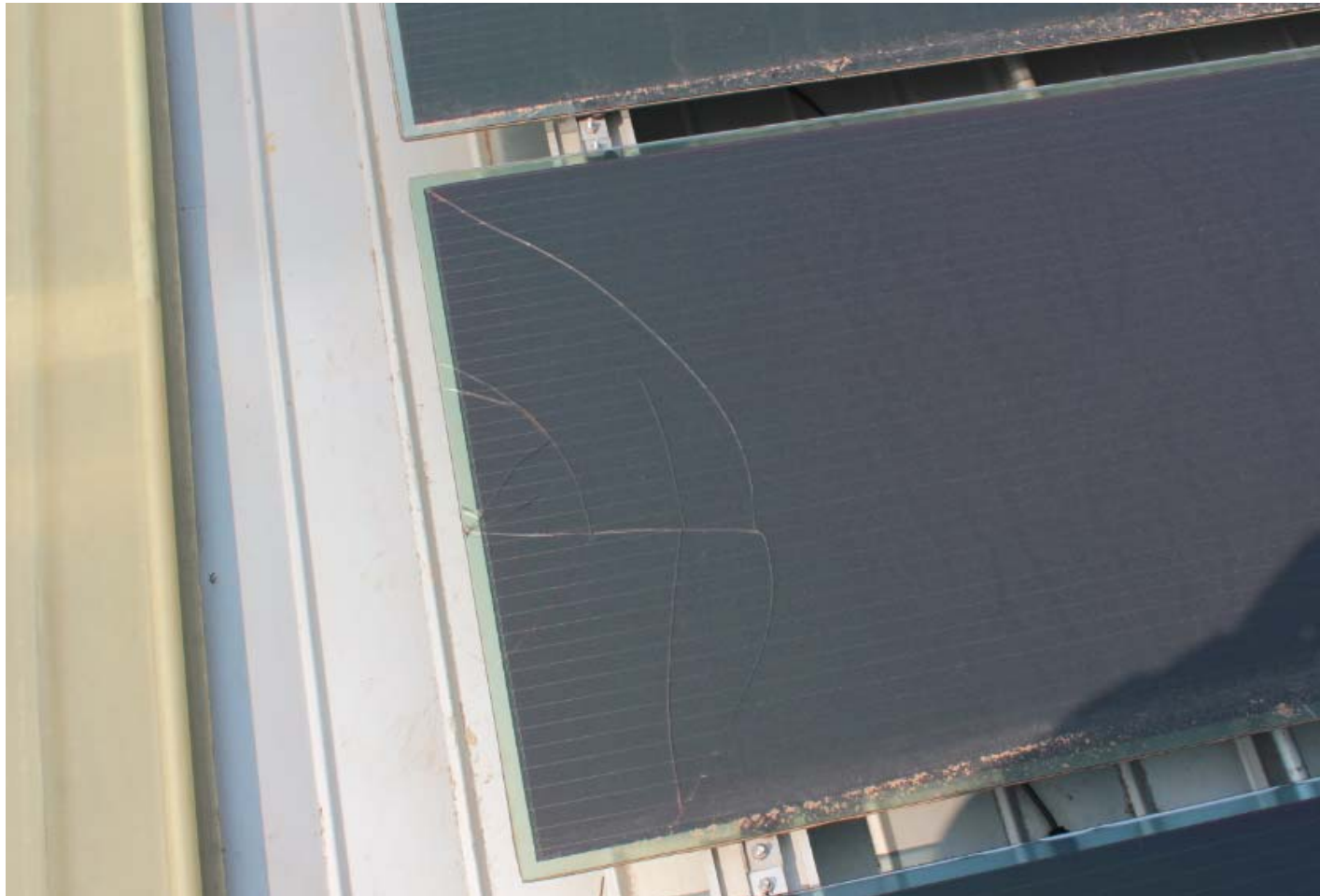
Risk & Casualty



Risk & Casualty



Risk & Casualty



Risk & Casualty



Risk & Casualty



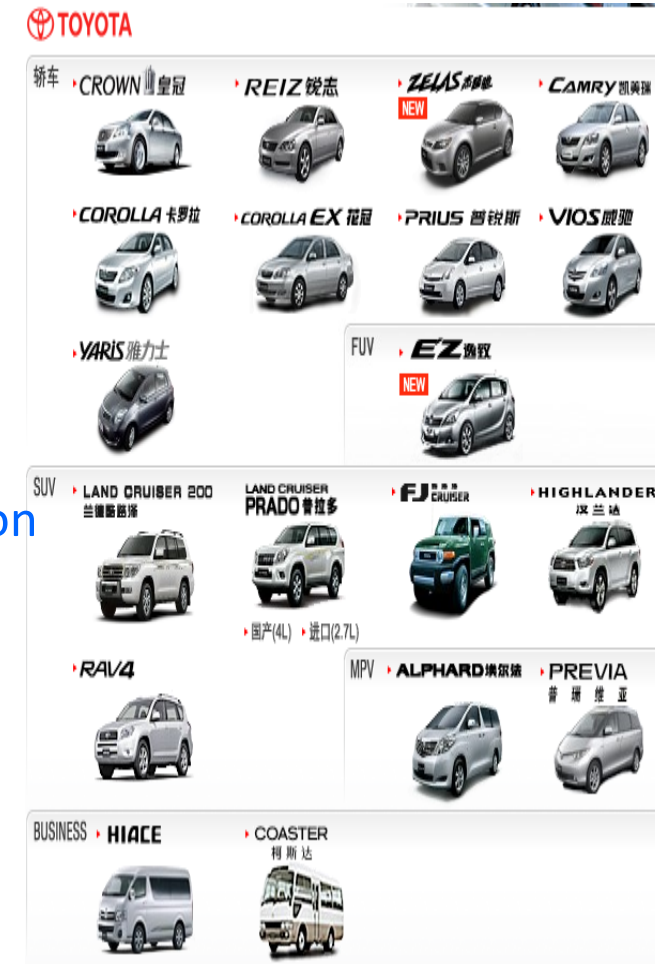
Risk & Casualty



Learn from other Industry



- Who shall we learn from
 - Real Estate
 - Automobile
 - Clean Development Mechanism
- What shall we learn
 - Mature Industry & Mature Market
 - Risk Management, Technology & Innovation
 - Financing, Insurance, Marketing & Service



Pilot Project: New District of Turpan



- “Local unique clean energy and suitable ecological technology will be used in New District of Turpan, which will become a distinctive, residential, and harmonious ecological demonstration urban.”

Planning of New District of Turpan(2009-2020)



太阳能综合利用为核心
Core: Photovoltaic Technology



慢行及公交出行为主导
Predominate: Electric Vehicle



低碳社区
Low Carbon Community

3. Cooperation Proposal



1. APEC Photovoltaic Application Roadmap and Model Study (PVARM)
2. APEC Photovoltaic Communication and Cooperation Platform (PVCCP)
3. APEC Low-Carbon Model Town Development Model and Tool Kit Study (LCMT-DMTK)



3.1 PVARM



- Photovoltaic Application Roadmap and Model Study (PVARM)
- Goal
 - Share the valuable data, information, experiences from casualty and mistakes
 - Find out proper solution
 - Improve Learning Curve
- Output:
 - Roadmap
 - Model
 - Took Kit



3.2 PVCCP



- Photovoltaic Communication and Cooperation Platform (PVCCP)
- Whole Cluster
 - Technology
 - Policy
 - Commercial
- 3 Technology
 - Renewable Energy Technology
 - Traditional Technology
 - IT Technology



3.3 LCMT-DMTK



- APEC Low-Carbon Model Town Development Model and Tool Kit Study (LCMT-DMTK)
- 100 LCMT, could be best pilot projects and market for whole APEC member economies
- To introduce the outcome from cooperation between China and EU
- Tool kits including planning, design, construction, maintenance, etc.

Thank you for your precious time



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- Mr. WAN Lin graduated from Renmin University of China in 1994, majored in Industrial Economics and International Economics.
- He joined China Classification Society, CCS in 1994, having worked as strategy researcher, production inspector, project manager, cooperation department manager, assistant to Chairman of International Association of Classification Society (IACS). He was appointed as the general manager of China Classification Society London branch in 2003.
- In 2005, he acquired the Master degree in MSc Shipping, Trade and Finance at CASS business school, City University, London. He went to the US for Tri-State (New York, New Jersey, Connecticut) Maritime Cluster Research sponsored by the Baltic Exchange scholarship in 2005.
- He joined China General Certification Centre (CGC) as vice president in 2008, in charge of PV, solar thermal business, as well as Strategy & International Cooperation.
- He is CCAA Senior Auditor, member of China's national PV standard committee and IEC, and main contact window in renewable energy cooperation between China and US, EU, AFRICA, APEC, BRICS, Mainland and Taiwan, as well as Co-Chairman of WG Standard, Testing & Certification in China-US RE cooperation, and steering committee member of PV Quality Assurance Forum.