Speaker Series

Experts' views for expert investors

China

Power

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Water and fire

With the global nuclear renaissance stalled by Fukushima, China is relying more than ever on hydropower to keep the economy growing. We expect the country to add the equivalent of eight Three Gorges dams by 2020. The dambuilding frenzy is most intense in China's ecologically sensitive southwest. As hydro engineers fight farmers and city planners for dwindling water resources, the central government is being forced to rethink its stance on water resources - hydro in particular.

Dammed if you do . . .

- China aims to cut its energy intensity by 16% by 2015 under the 12th Five-Year Plan (FYP).
- Carbon intensity is to be cut by 17% by 2015 and 40-45% by 2020.
- Nuclear power is key to meeting these targets, but the Fukushima disaster has thrown Beijing's expansion plans into disarray.
- Hydropower is becoming even more important and we expect the mainland's hydro capacity to grow 73% to 370GW by 2020 - equal to eight Three Gorges dams.

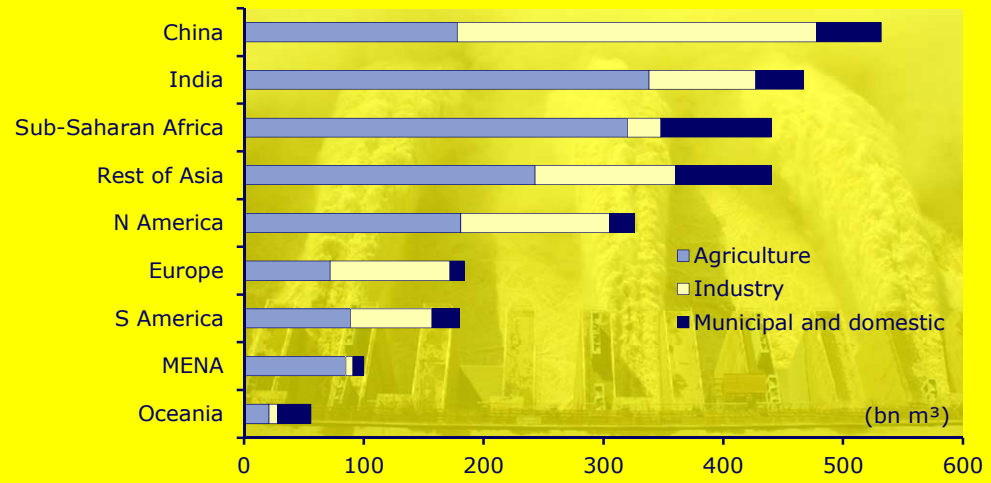
Southwest suffers from China's insatiable thirst

- Hydropower operators are fighting an increasingly tough battle with farmers, industry and urban areas for dwindling water resources.
- Water scarcity is worst in the north, where one-third of China gets by on 7% of its water resources, but water-diversion projects are also starting to drain the south.
- Eight of the country's 13 hydropower-development zones are concentrated in the ecologically diverse and earthquake-prone southwest.
- Yunnan Province accounts for just 2% of China's GDP, but is home to an amazing 10% of the world's species.

Perils of a power vacuum

- There is no shortage of government bodies with a say in water policy; this has led to a power vacuum, where no single body is accountable for decisions.
- Rules are being flaunted, resulting in mass protests.
- In July 2011, China convened its highest-level meeting ever on water resources, granting priority to agricultural projects.
- Hydro plans are already set for the 12th FYP, but there is implied risk for the 13th.

Annual water demand rising



Source: McKinsey, *2030 Water Resources Global Water Supply and Demand Model*

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Su Liu

Su Liu is the Greater China Coordinator and Policy Researcher at Hong Kong-based think tank Civic Exchange and the China representative of C40 Cities - Climate Leadership Group. She is a former public-opinion researcher (Deputy Managing Director of the Gallup Organization HK) and communications strategist (Deputy Managing Director of Wirthlin Worldwide Asia).

Foreword

Frequently in China's long history, dynasties have flourished or collapsed depending on their ability to control the flow of water. The symbol of the current rulers' hydroengineering aspirations is, of course, the Three Gorges Dam across the Yangtze River. Originally envisioned by the father of the Republic of China, Sun Yatsen, the dam was approved in 1992 and completed in 2009.

Given the project's prominence and historical importance, the State Council's statement in May that the dam faced 'urgent problems' came as a bit of a surprise. Problems cited include: 'the smooth relocation of residents, ecological protection and geological disaster prevention'. These issues would certainly come as no surprise to the many environmentalists and engineers who have spoken out against the project, or to the 1.4 million people that have been relocated. However, the immediate catalyst for the State Council's about-face was probably the drought afflicting the Yangtze - the worst in 50 years - which had incited complaints and protests, especially from farmers.

Conflicts over China's dwindling water resources are only going to get worse. The parched north is counting on three massive water-diversion projects to stave off encroaching deserts. Meanwhile, the south has to meet steadily rising water needs with shrinking supply. Farmers and urban planners will face intense competition from dambuilders to determine how, when and where the water flows. Hydropower is a key element in China's attempt to expand and decarbonise its energy supply, and we project the country will add 370GW of dams by 2020, or the equivalent of eight more Three Gorges.

Our guest speaker Su Liu, Greater China Coordinator at the Civic Exchange, has worked extensively with activists, officials and scholars to determine what is going wrong with the country's hydro programme - the world's largest - and what can be done to fix it. Her work has focused on the ecologically sensitive, earthquake-prone southwest, the location of eight of China's 13 hydropower-development zones. Yunnan Province accounts for just 2% of China's GDP, but is home to an amazing 10% of the world's species.

A surplus of government bodies with a say in water policy has, paradoxically, led to a power vacuum, with no single body accountable for decisions. Even where rules are established, they are openly flouted. Su has documented dams already built that are still awaiting government approval or an environmental impact assessment. Pliant officials and private police forces have mostly been successful in sweeping complaints under the rug.

But anger is rising and the times are changing. Increased scrutiny and debate about hydropower is inevitable. Protestors in Dalian set an important new precedent in August when they strong-armed the local government into shutting down a controversial chemical plant. Hydropower is important to China's leaders, but not important enough to risk the dynasty.

Charles Yonts
Head of Sustainable Research

Water and fire

Su Liu

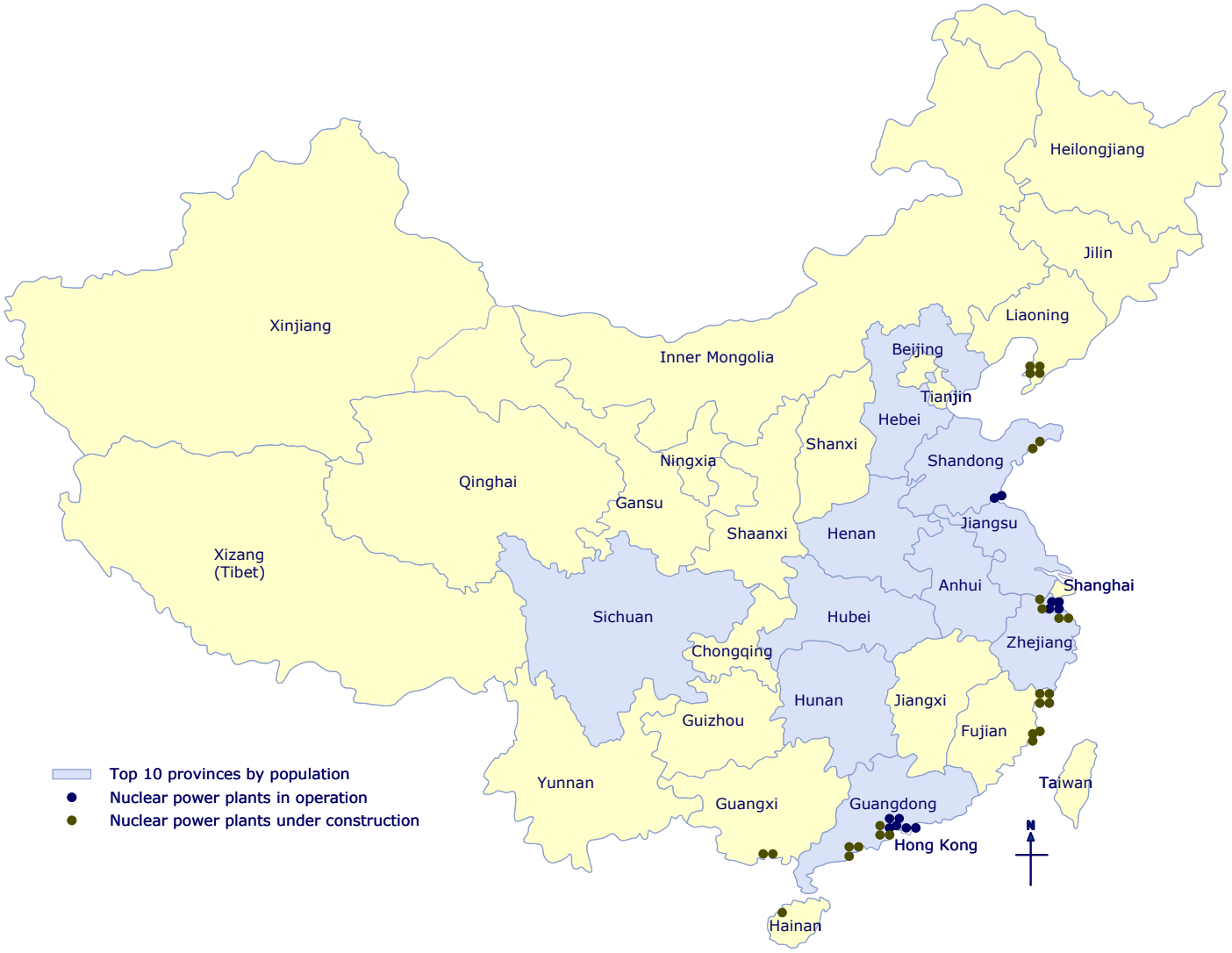
The change in China's energy mix from the 11th Five-Year Plan to the 12th shows a major commitment from the central government to reducing coal-fired power dependency and increasing renewable energy sources.

Nuclear being reassessed post-Fukushima

For the 12th Five-Year Plan, the government has imposed two additional specific goals on central and local government officials. First, they will need to reduce energy consumption by 16% per unit of GDP. Second, at the same time, carbon-dioxide emissions must be reduced by 17%. Originally, nuclear power was to play a significant role in meeting these targets. However, since the events at Fukushima on 11 March, the world's focus on the safety of nuclear power has had a significant impact on Chinese strategy and policy.

Figure 1

Nuclear power plants in China



Source: IAEA, CLSA Asia-Pacific Markets

Power shortages are still an issue

Post-Fukushima, China's policy for nuclear-power development has changed. The government is reassessing the safety of nuclear plants. Experts estimate that this may delay Chinese nuclear development by two to three years. But the key issue is that with or without this delay, China is still facing significant power shortages.

This year we are seeing power shortages due to severe drought. Another problem is that some of the newly added clean energy, such as windpower, cannot be connected to the grid.

The government has few options beyond hydro and coal

This produces a serious challenge for the Chinese government, particularly for the first year of the next Five-Year Plan. The government is faced with difficult questions about what it will do for the clean development mechanism. Is it going to be water or fire, given that nuclear power is now under reassessment? Windpower is not ready to play a bigger role, and there are not many other options that we can choose from.

So let's look at 12th Five-Year Plan. What role will hydropower play? The national goal is that by 2015, around 11.4% of primary energy consumption will be from non-fossil sources. Of that, 6.5% should be achieved by hydropower alone. This means that hydropower development needs to be intensified in the next five years.

Most of our estimates are more aggressive than the government's

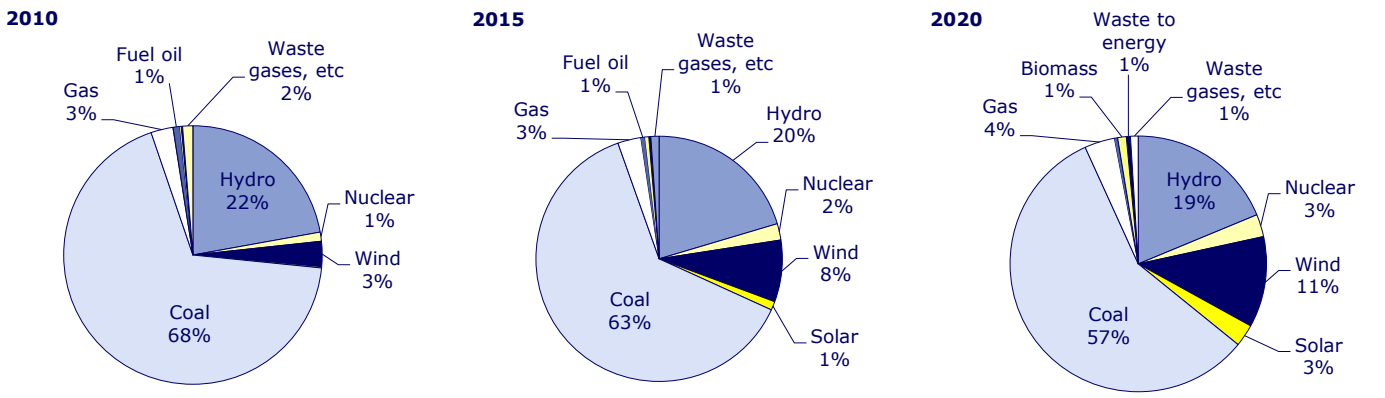
Figure 2

China power capacity - Government targets versus CLSA estimates

(GW)	2015		2020	
	CEC	CLSA	CEC	CLSA
Thermal power excluding gas	933	953	1,169	1,153
Hydro	325	300	390	370
Nuclear	43	32	90	56
Wind	100	120	180	227
Solar	5	17	20	55
Biomass and others	3	7	5	21
Gas	30	45	40	75
Total capacity	1,436	1,474	1,887	1,958
Base load as % of total	70.3	70.3	69.1	66.7
Non-fossil capacity	433	445	596	674
% of total	30.2	30.2	31.6	34.4

Figure 3

China's power-capacity mix, 2010-20



Source: CEC, CLSA Asia-Pacific Markets

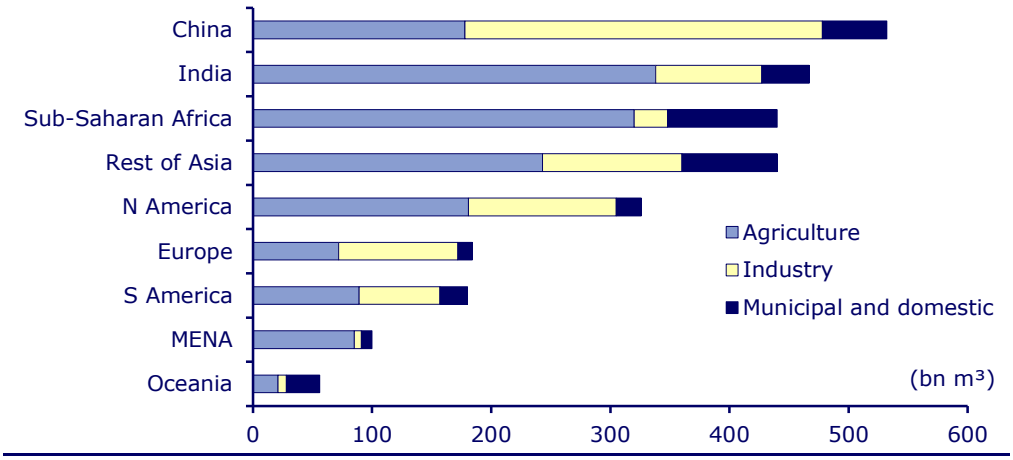
Is there enough water?

The first question we need to ask is do we have enough water for power?

China's water demand set to take off

Figure 4

Increase in annual demand for water, 2005-30F



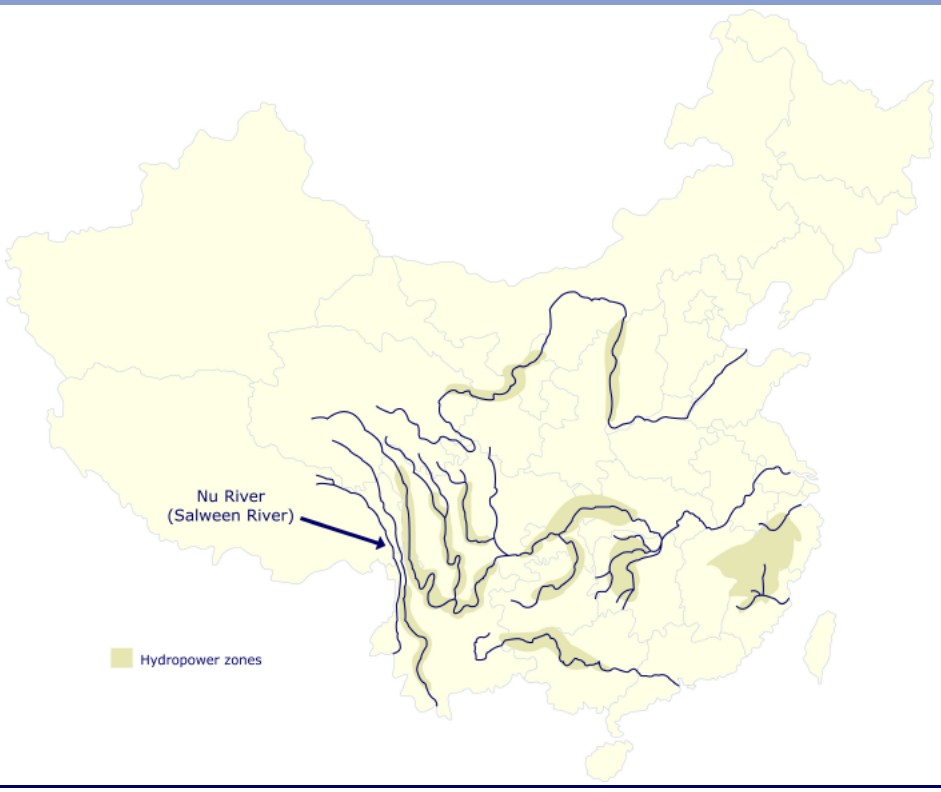
Source: McKinsey, *2030 Water Resources Global Water Supply and Demand Model*

South-north diversion project has impacted water resources

China has a south-north water-diversion project with three lines: eastern, central and western. The eastern line has been completed, but the diverted water is not quite usable due to heavy pollution. The western line is still in planning. The central line has been postponed. According to the original plan, it should have been completed and available for Beijing and Tianjin residents to use by 2010. However, due to lack of project coordination, financial issues and conflicts of interest, this project has been postponed until 2015.

Figure 5

Hydropower zones in southwest China



Source: CLSA Asia-Pacific Markets

The impact of these water diversion projects is that they will take a significant amount of water out of rivers on which future hydro development plans rely.

Most of the hydropower zones are in the southwest

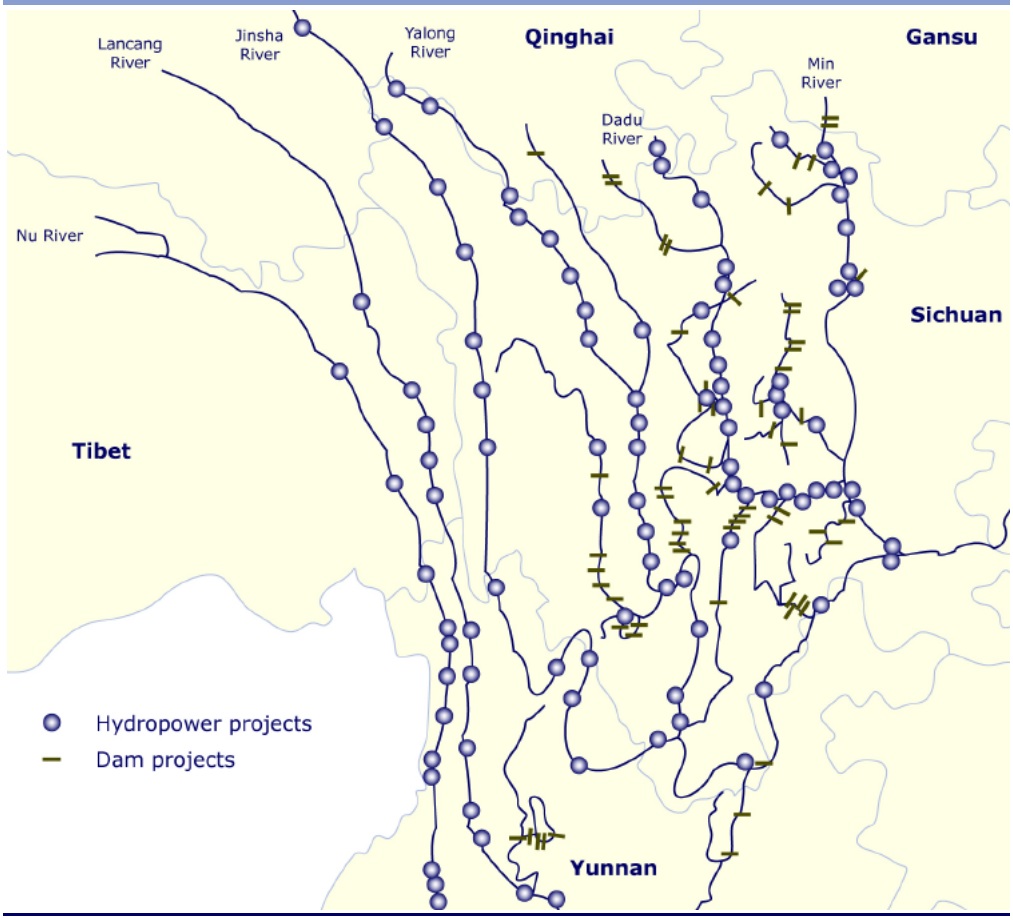
Eight of the 13 hydropower development zones in China are concentrated in the southwest. Those areas are also home to China's great agricultural production bases. Several of those agricultural bases also rely on that water. In those areas, dam projects have been developed substantially. Figure 6 shows an area in southwest China that we call the Great Shangri-La region, which borders Tibet, Yunnan, Sichuan and Qinghai provinces. This is one of the richest water-catchment areas and is also geographically very significant.

These areas are also agricultural production bases

Figure 6

This region has been heavily exploited for hydropower

Dam projects in the Great Shangri-La region



Source: CLSA Asia-Pacific Markets

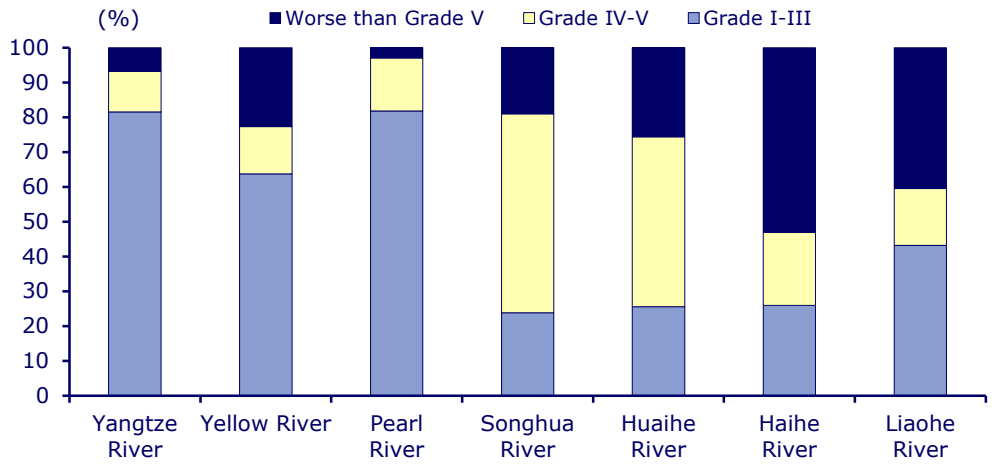
Concerns over the impact on agriculture

The map shows all the dam projects either existing or under construction.

In addition to the large hydropower and dam projects, there are also many small hydro projects - small dams on tributaries of the rivers - in Sichuan, which has been exposed to intense hydro development. All of those projects raise the question of whether there is enough water for agriculture, supporting the local ecology, drinking water and hydropower generation.

Figure 7

Water quality of China's rivers



Note: Grades I-III are classified as safe for drinking and bathing, while grades IV-V are for industry and agriculture. Anything worse than grade V is unusable. Source: Report on the State of the Environment in China, Credit Agricole Securities (USA)

Yunnan is home to 20% of China's biodiversity and 25% of world's animal species

Rich biological diversity under threat

Hydropower development also impacts environmental capacity and geological stability. Southwest China is one of the most ecologically sensitive regions in the world. Yunnan Province generates less than 2% of China's GDP but hosts 10% of the world's species and 20% of China's biodiversity. The Three Parallel Rivers area, on the border of Yunnan and Sichuan, is listed by Unesco and holds one-quarter of the world's animal species.

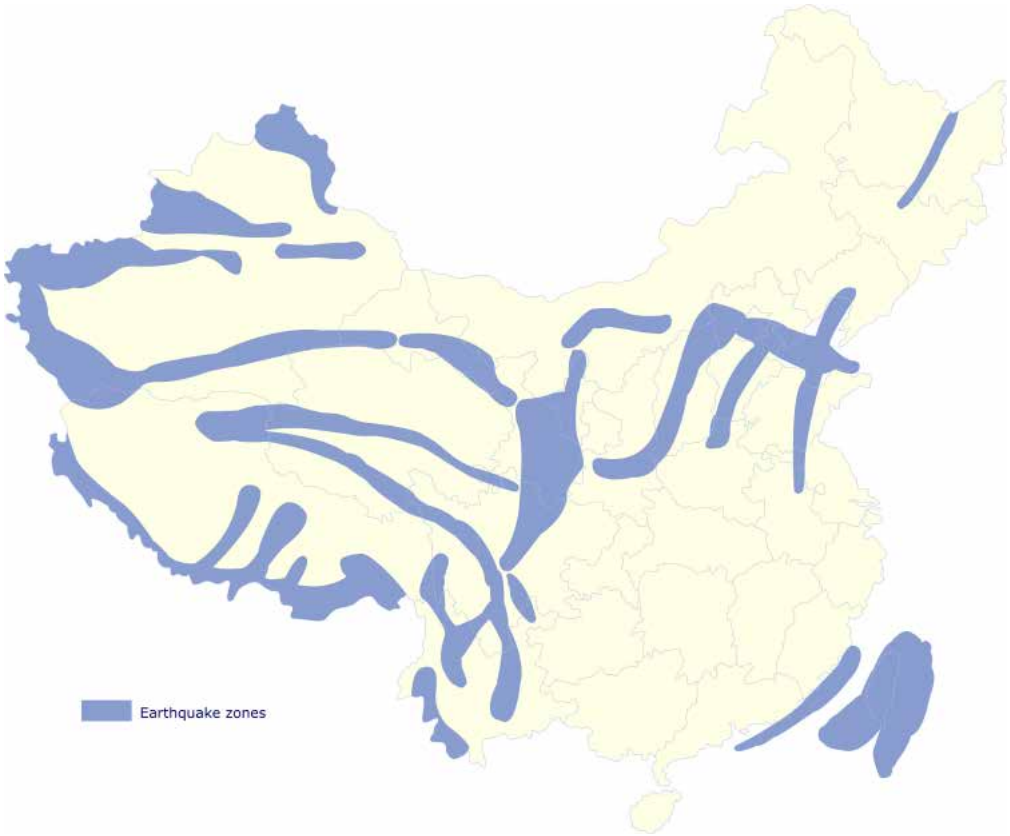
China's earthquake epicentre

The Three Parallel Rivers area is listed by Unesco not only for natural beauty but also for its place among major geological events in the ongoing evolution of Asia's land surface. Additionally, in the past century the epicentres of most of China's strong earthquakes have been located in the Tibetan and the Qinghai plateaux, as well as in the Hengduan Mountains area of Yunnan and Sichuan. Naturally, those are water-catchment areas and have major rivers running through them.

Many mega dams are located in earthquake-prone regions

Figure 8

Earthquake-prone regions in China



Source: China Earthquake Research Institute, CLSA Asia-Pacific Markets

Figure 9 lists earthquakes greater or equal to magnitude 7 over the past 60 years. We can see most of those major earthquakes happened in Yunnan Province, followed by Tibet, Sichuan and Qinghai. If you look further, you find that lots of China's mega hydropower stations are located in these earthquake-prone areas. We often wonder how hydropower can be developed in this region, given its ecological sensitivity and geographical instability.

Many big earthquakes near dams

Figure 9

Magnitude 7-plus earthquakes in southwest China and Tibet

Date	Magnitude	Epicentre
15 Aug 1950	8.6	Tibet, Chayu and Motuo
18 Nov 1951	8.0	Tibet, Dangxiong
4 Jan 1970	7.8	Yunnan, Tonghai
6 Feb 1973	7.6	Sichuan, Luhuo
29 May 1976	7.3	Yunnan, Longlin East
29 May 1976	7.4	Yunnan, Longlin
6 Nov 1988	7.6, 7.2	Yunnan, Gengma
11 Jul 1995	7.2	Yunnan-Burma border
3 Feb 1996	7.0	Yunnan, Lijiang
8 Nov 1997	7.9-8.0	Tibet, Mani
14 Nov 2001	8.1	Qinghai-Xinjiang border
12 May 2008	8.3	Sichuan, Wenchuan
14 Apr 2010	7.4	Qinghai, Yushu

Source: Xu Daoyi, Sun Wenpeng

Who's in charge?

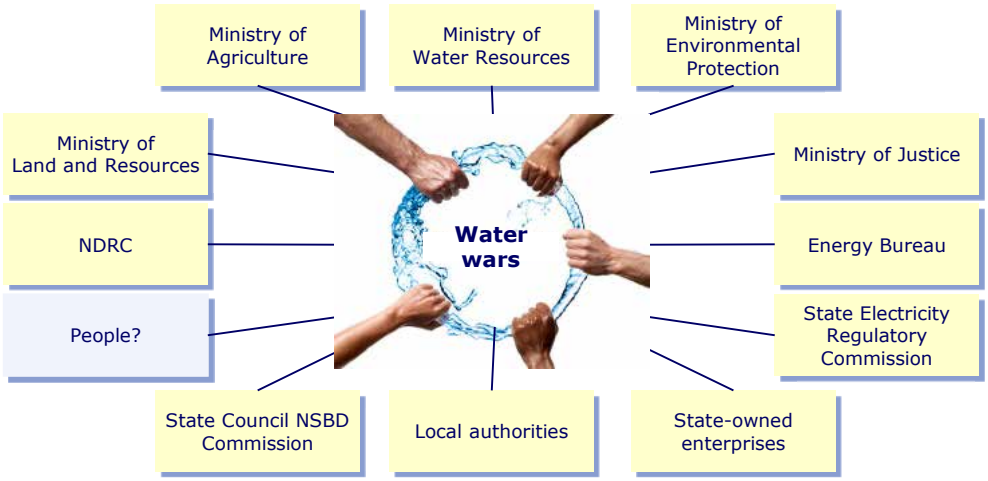
Many bodies have a stake in water development

In China there are many ministries and government bodies that have a say in water issues, including the National Development and Reform Commission (NDRC), Ministry of Water Resources Management, Ministry of Mining, Ministry of Environmental Protection, Justice, etc. Because so many different bodies have a say, it has created a vacuum where nobody can be held accountable for decisions, leading the Great Shangri-La region to be developed by many different projects. Among these, mining (gold, copper, lead and iron) and hydropower stand out.

Individuals are often underrepresented in the "water wars"

Figure 10

Who has a say in water projects?



Source: Su Liu

Locals often suffer when water resources are overdeveloped

Such development can produce ecological degradation in the region, such as deforestation and dried-up rivers. Many local inhabitants rely on these rivers for sustenance. The development has had another unexpected side-effect. Because many of these projects are in remote regions and cannot be connected to the national grid, many high-energy consuming industries have been set up close by to take advantage of the surplus power. These projects are often characterised by the "three highs": high pollution, high energy consumption and high emissions.

These regions were previously underdeveloped and lacking infrastructure for water and waste treatment. Thus, the local environment was not able to cope with the rapid change and this type of development contributed 40% of China's water pollution.

Environmental protection policy is usually ignored

Lots of the problems such as these were caused by poor processes. The government already has strong environmental protection laws, but in reality such protection is often shunted aside, with hydropower development being a prime example. Frequently, rivers are dammed while the environmental impact assessment is still underway and the project is still in public consultation. We saw a firsthand example of this when we went to photograph a project towards the end of last year. When we got there we discovered the river had already been cut off, despite the fact that the environmental assessment report had just been released for public consultation.

Figure 11

Li Yuan project

Source: Wang Yangchen

Figure 12

Complicated nexus of vested interest groups

Translation: Armed Police Force, Hydropower Development, Special Corps 1. Source: Su Liu

Hydropower development is a sensitive issue and attracts a complicated nexus of vested interest groups in China, including armed police forces. Hydropower development not only impacts the ecology and imposes geographic danger; it also poses a threat to security and social stability. Southwest China is not only rich in water and mineral resources, but also has many minority peoples and is culturally diverse.

Rich in water, minerals and minorities

Figure 13

Southwest China is biologically and culturally diverse

Source: Su Liu, dili360.com

Demonstrations against hydropower are frequent

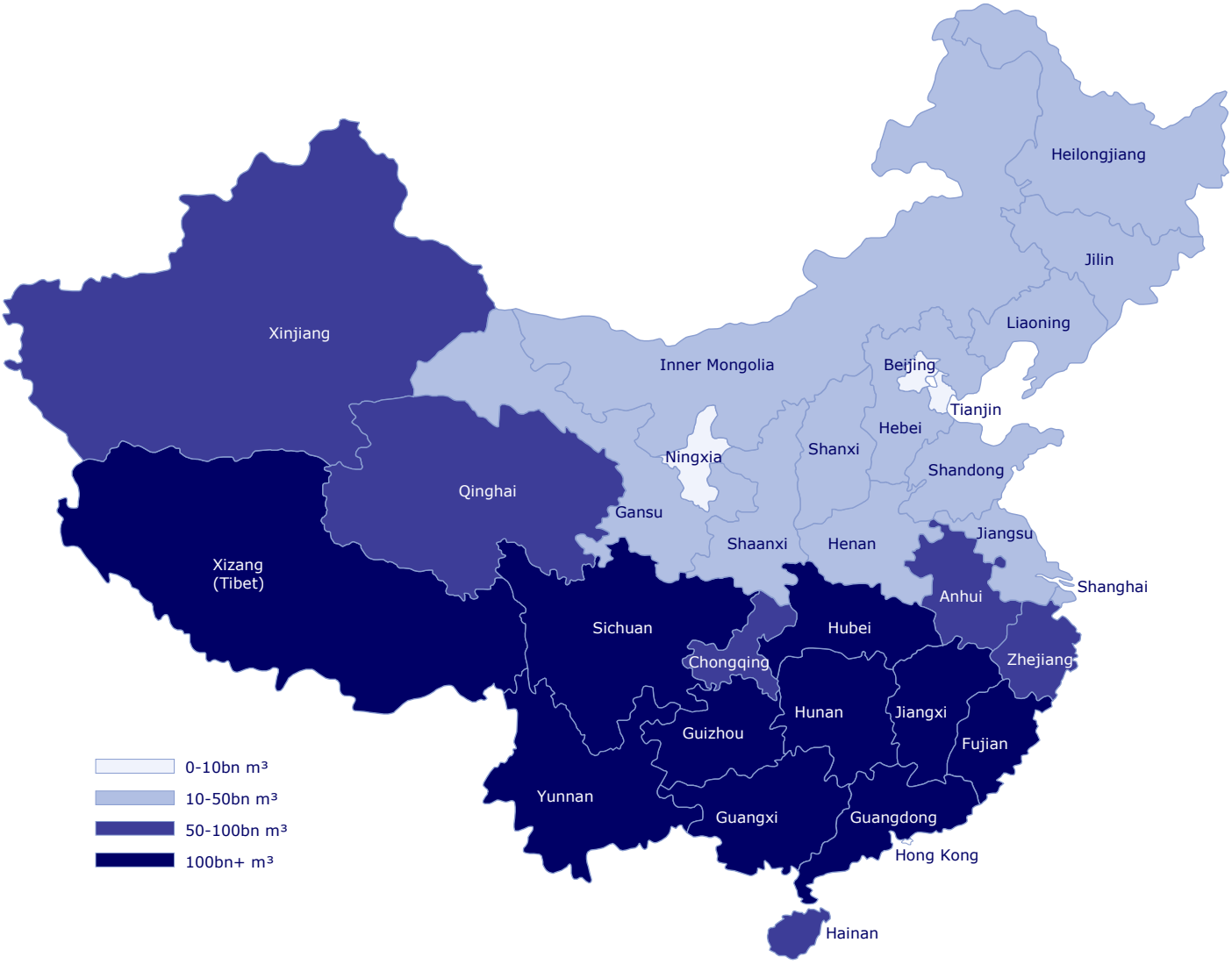
Mass demonstrations are another side-effect of hydropower development in China. There have been reports of more than 10,000 local residents protesting against the government due to forced relocations. Such events will continue to happen as long as the government forces people to move.

Damming of rivers impacts China's neighbours like India

China is also the source of many rivers that flow to neighbouring countries. Some of these begin in Tibet, such as the Mekong and Salween rivers; others flow from Yunnan Province. There are already tensions due to hydropower development inside China, which has stirred fears among its neighbours. So hydropower is not only a domestic issue; it also has implications for international relations and national security.

Figure 14

China's total water resources



Source: China Yearbook, CLSA Asia-Pacific Markets

Question I think the first question would have to revolve around the big conference chaired by Hu Jintao (in July 2011). I believe this was the biggest conference ever on water resources, or the most important. Su, could you run over the key takeaways from this conference and what might change, or what it suggests, for the government's approach to water resource management. Is it something we can actually get excited about? Could we dare we get optimistic?

Su Liu Oh, yes. I think this is really a very positive sign. After the so-called "new China" was established in 1949, the government put a lot of emphasis into water resources, water conservation and infrastructure building. Even in the 1950s and the 1960s - and even during the Cultural Revolution when everything else was

destroyed - rural water-conservancy and infrastructure-building still continued. However, after the reforms in the 1980s, the public communal structure was destroyed and these water-conversancy projects were stopped.

Biggest water conference in CCP's recent history

That's also why in the past 30 years, central-government investment - and also rural investment - in water conservancy has not been great. It's actually decreased every year. Although experts have been appealing for the central government's attention, it was never raised up to a strategic and a national-security level. But more recently, the central government has showed their determination that they are going to pay attention to it. This conference is the first time in Chinese Communist Party's history, that all of the chiefs of provinces, the party secretary, prime minister and also all ministers, gathered together about water-resources management and better governance.

Allocated 10% of land-tax income for rural water conservation

I see three key takeaways. First, they not only talked about water conservancy as national strategy and a security issue, but also devised a financial mechanism, which is that 10% of the land-tax income will be allocated to water conservation in rural areas. This has been made very clear and with a specific measurement. They can actually track the spending down to the level of local governments and local officials.

Second, Hu Jintao said it's going to be a central-government-led project, rather than being controlled at the provincial level. The Chinese market is policy-driven, so if the central government makes a commitment, it can pretty much remove any obstacles at will.

Government considering a new approach to water conservation

And third, Wen Jiabao has six points about how to actually implement such a plan. It will start with scientific planning, coordinated mechanisms, and management, and will focus on a variety of aspects to achieve a coordinated effect. Believe it or not, this is the first time I have heard the central government leadership say that they need to look at resources to determine what we supply. Previously, the approach has always been to do whatever you can to supply, without questioning whether the demand is sensible or reasonable. This time, Wen Jiabao said, 'we need to go with what we have in terms of water, and according to what we have, allocate to demand.' So this is a new way of looking at the problem from the government.

Not an endorsement of hydropower development

What are the implications for investors? After this conference some mistakenly believed that a hydropower spring is arriving and that you should focus your investments on this sector. I don't believe that to be the case. Hydropower is not the same as rural water conservation. They could be related, but they are definitely not the same. The new policy has a lot to do with the infrastructure of water conservation, the pipes, pumping stations, drip irrigation, and the machinery needed to build such infrastructure.

Main message of the meeting was sustainability

I am sure there will be some positive impact on the hydropower sector. However, for the hydropower builders, this policy is not necessarily positive.

Question

Looking at all the different ministries and the different groups who have a say in water projects, would the recent conference help at all to set the pecking order - to see who gets the authority in water projects? The second question is: is there a priority list for which type of project receives water first or receives funding first?

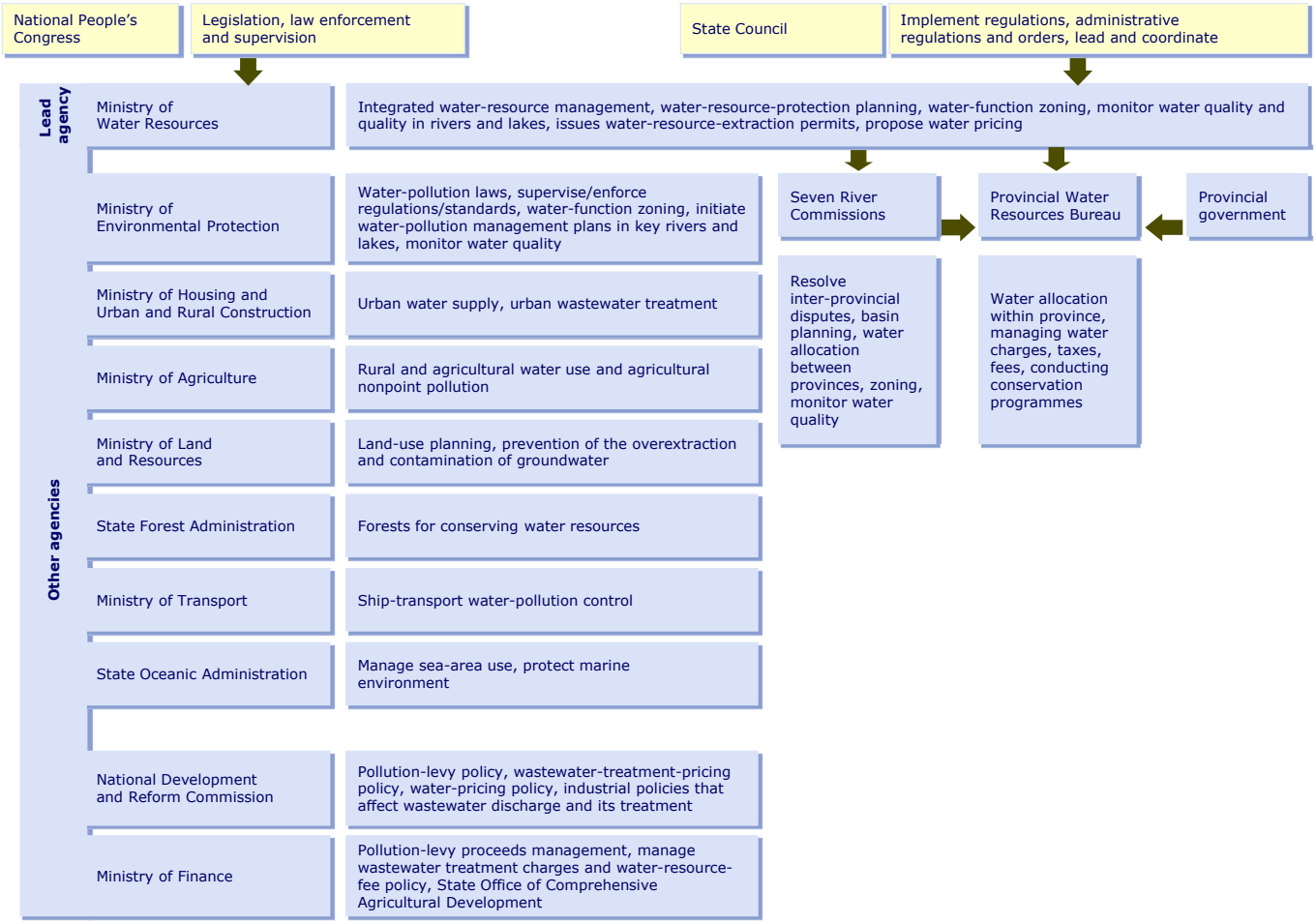
Su Liu

First, who has the power? Previously, Chinese water matters were managed under one department which was the Water Resources Ministry. This was the case until the 1980s, when everybody was able to start approving water

projects. At this time, if you could not get approval from the Environmental Protection Department, you would go to NDRC. They have the authority to actually grant permission to start hydropower development. Now, the Chinese government tried to develop a coordinated mechanism to manage all water issues, by setting up the so-called Watershed Management Committee, but it did not have enough power to be effective. The State Council has already set up a new coordinating group, which had its first meeting at the end of May to create and coordinate a new mechanism. This new group will have ultimate power over future projects and development.

Figure 15

Ministries and authorities involved in water management



Note: Chart adapted from J Xie et al, *Addressing China's water scarcity: Recommendations for selected water resource management issues*, World Bank, 2009, p.31. Source: Civic Exchange, SynTao

Water Resources Ministry has the most power over water affairs

At the moment, if you ask me who has the most say with Hu Jintao and Wen Jiabao, it would be the Water Resources Ministry. But don't forget the NDRC. This is a very specific situation in China. The NDRC is supposed to be a government think tank, but it actually has a lot of power. It can invest, grant permission, call off projects and also suggest, so it is an interesting department. Its role sometimes creates conflict.

Secondly, Is there a priority in the investment? Yes, agricultural production-related projects definitely are the top priority. This has been emphasised by Hu Jintao and Wen Jiabao. What is agriculture-related work? It is more about villages and agriculture. Irrigation is one of these things, especially new, water-saving irrigation techniques.

Question

I'm just wondering on the attitude of the Chinese government, given the performance of hydro projects like the Three Gorges Dam. From what I'm aware, the water flow through that project has not really met the expectations that were in place when it was constructed. It the lack of water flow having any effect on government decisions to produce more hydro projects, or are they just willing to go ahead and put poor results from previous projects to one side?

Su Liu

For the Three Gorges project, definitely. My personal understanding is the project contributed to this recent high-level meeting, because the Three Gorges has been in dispute for so long and it attracted so much public attention this year. Another thing I would like to mention with the Three Gorges is that the problems were not due to a lack of vision. The problems were more about implementation. In much the same way as with last year's Rmb4tn stimulus plan, there are good intentions but once it gets implemented, the policy becomes twisted.

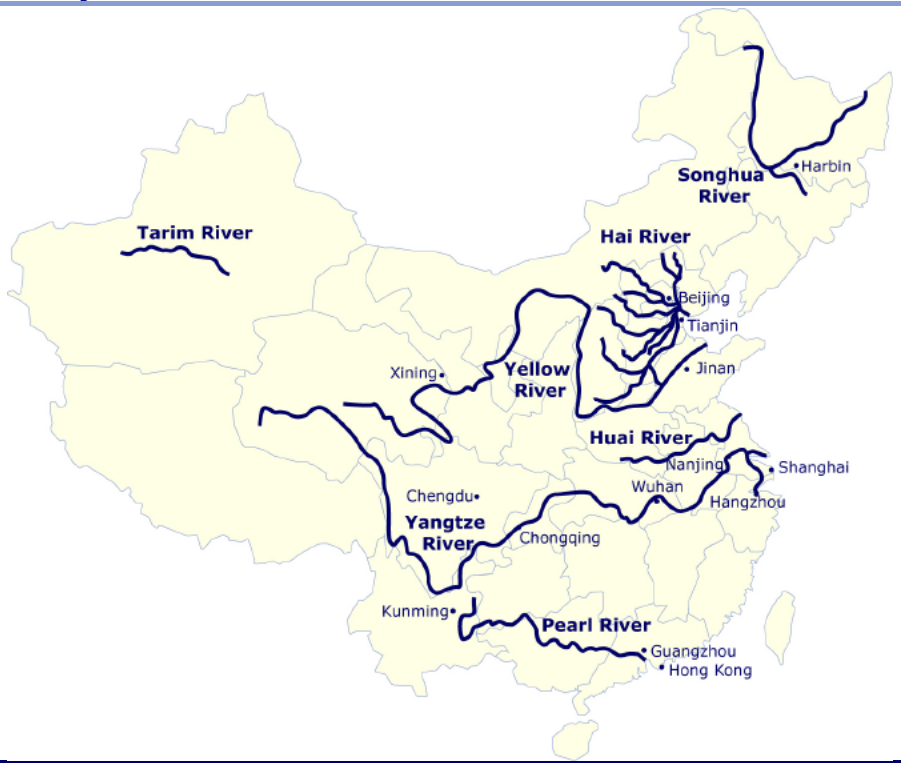
Main purpose of Three Gorges Dam was flood control

As for the Three Gorges, the main goal was flood control. After the project was implemented, it was talked about as one of the solutions to China's energy shortage. So this secondary purpose has taken all the attention, while the other reasons for the dam have been underscrutinised. I looked through all the speeches from the recent conference, and the central government did not say that this new movement about water conservation is actually meant to enhance hydropower. That is why I said this is not about hydropower.

Figure 16

Yangtze, Yellow, Huai and Tarim rivers are heavily polluted

China's major rivers



Source: CLSA Asia-Pacific Markets

So the point we need to remember is the dams themselves - especially the big ones on major rivers - are not really sustainable. A lot of scientific research has shown clear evidence that hydrological and ecological systems that have evolved over millions of years cannot be altered within a short span

of two or three decades. The damage is not easily repaired. So if China builds so many dams on its rivers, the control mechanism cannot be coordinated. This creates conflicts and also affects social stability.

Question You mentioned that in the news today there was something specific about a mechanism that would allow the government to monitor how the 10% tax is being implemented. I think it would be interesting to go into that a little bit more.

Su Liu The details are still under research, but the determination is that there is a mandatory requirement for 10%. The local government cannot take it and use it for other purposes. So if the funds are misused, the officials who were responsible will be made accountable. This was announced by the central government, but how specifically they will implement this is still unknown.

Question Following the meetings this weekend, is there another date we should be watching for - another meeting we should be watching for - to get more finalisation on some of the specifics around the plans that they've launched?

Su Liu Usually for such high-level government decisions it takes at least six months or one year for the actual tactical plans to be determined. For the water issue, it is already such a highly-stressed issue, so it can be fast. But personally I think a lot of those investigations are not finished or not even started yet, so it may still take some time.

China's first ever water-resource census is taking place now

One thing is that early this year, China started its first ever water-resource census. This is still ongoing. The preliminary results will be ready at the end of the year, but the finished report will not be ready until next year. So this is one of the things that can give you a better indication on what the situation is and where investment should be going. The other is they are also going to start a survey of water reservoirs and dams. This has not been done before. According to some insider news, it has already started, but will be worth watching to learn more about the current situation.

Question You mentioned before in your presentation the south-north water diversion, which is an interesting project. Do you think you could give just a brief introduction on what it is. I don't know if it actually fits into hydropower, but I'm wondering if anything that they've said today in the news would affect that project and what the future of that is, because that's something that's been going on for quite a long time.

Su Liu The south-north water-diversion project is mainly to solve China's water distribution, which is very uneven. One-third of China's GDP is in the northern region and around 64% of the population and industry growth is in that region as well. However, this area accounts for only 7% of water resources. So to solve the severe imbalance in population and water distribution, the government came up with the south-north water-diversion project.

Project is meant to bring drinking water to the north

Whenever the leadership in China changes, its first pressing issue is to solve the north's drinking-water problem. It doesn't have enough water and climate change has already reduced surface-water flows. This diversion is seen as a matter of survival, not merely to support industry and agriculture. The water-diversion project takes a significant amount of water away from the Yangtze River to supply the northern regions that used to be supplied by the Yellow River. The Yellow River used to be known as the Mother River of Chinese civilisation. But after the "new China" was established, there were a lot of dam projects on the Yellow River and deforestation due to agriculture projects on the upper streams. The river has been damaged ecologically and is essentially no longer flowing freely.

Figure 17

South-north water-diversion project

Source: www.nsbd.gov.cn

Three routes for diverting water to the thirsty northern region

But has damaged China's major rivers in the process

To save the Yellow River and meet northern China's growing demand, water must be diverted from the Yangtze River, which has plenty. This water will eventually be used to supply Beijing and Tianjin, which are the centres of the Chinese political system. This project was already under construction when another significant hurdle cropped up. Pollution had increased severely, and once the eastern line was completed, the water was not useable. So they have to treat the polluted water first before it can actually be supplied to people. The result is they have to speed up the project's central line. But they also have problems there.

Many stakeholders in the project

Local governments have a lot more say over the central line. In the past, they had no say under China's centralised economy. But now things have changed. Local governments can bargain with the central government and the central line is facing pressure because of this. Also, the point at which they are going to divert the water is one of the major tributaries of the Yangtze River. This area has a high population density and a lot of heavy industry is there. So there is a very strong conflict locally with the people whose water is going to be taken north.

Question

I have a couple of questions. The first is a broader question. Where you talk about social stability issues and the fact that people have been protesting, do you think that, firstly, the level of public dissent is being correctly or accurately reported? Given that the government is very, very nervous about social stability issues, to what extent do you think it's going to affect decisions to, for example, go down the small hydro route, rather than the large hydro route?

The second question was more specific. Considering that agricultural production and related projects constitute a priority area, do you think we're likely to see increasing support or incentives for farmers wanting to purchase irrigation or water-saving equipment? Do you think those industries are likely to receive positive news in terms of subsidy stakes?

Su Liu

Two very good questions. Stability is definitely a raw nerve. It's not only the central government; the neighbours are also very nervous. You can see the impact of this issue because not only did Hu Jintao and Wen Jiabao attend the recent conference, but also many other political bureaux members were there, as well as heads of major cities.

Water is a matter of social stability

The central government has already realised the water issue is a matter of social stability, social security and national security. There are urgent issues that need to be solved. The government has also definitely realised that there is another important issue underlying the main issue: that is, the safety of drinking water in rural waterways and also the safety of food. Right now drinking-water safety is not reported enough, but the Chinese live with these kinds of stories every day. One way or another, we hear about it.

People most impacted are vulnerable and lack information

This is more of a hidden problem and it is actually that the water pollution causes soil pollution and affects the food. This is definitely something the central government is aware of and also very nervous about. As for individual people, they also know about as problems of pollution, and cancer villages are in the newspapers every day. But on the other hand, the people who are most impacted and most vulnerable are not informed. Farmers, because of the agitation of the people, know of such matters. But children and elderly people who live in rural areas can be easily harmed by these dangers. So when you ask, 'is it reported?', I think definitely not enough. Right now stability overrules a lot of things for the central government.

You can make the point that the more you try to suppress such stories, the more you will build up the eventual rebellion, and that is what we see from the outside. But inside China, people are still very much afraid that instability will ruin their livelihood and their savings from the past 30 years of growth. So I think reporting on this kind of story will gradually increase, but it will be guided away by the central government.

Technology and money are not enough; you need labour too

Secondly, about support and extra stimulus for companies. There is some talk of subsidies for irrigation-water-saving technology, and some equipment for small hydro pump stations. Suggestions are that the government should give farmers in very poor areas free equipment. The central government will make investments annually and there is also the 10% from land taxes. But they have another issue to solve before moving into financial incentives, which is labour. Who is going to do the work? The majority of rural labour has already left for bigger cities. If you have technology and money, but no workers, then you cannot solve the problem.

Question

So if we were to start seeing pushback on big dam projects now, how long would it take before there was actually an impact on dams under construction or large hydro plants being planned? As equity investors, we're looking at both the hydro plant operators and the equipment makers. The big power-equipment names get a reasonable size of their revenue from selling the turbines for hydro.

Su Liu

For the 12th Five-Year Plan, it will not have any impact. Whatever is going to be built in the next five years has already been planned and some of it is completed already, without permission. So in the next five years I don't see a major pushback on the sector. You will still see quite significant growth, although we know there are a lot of side-effects and damage as well.

However, in the 13th Five-Year Plan and the one following that, there could be some major adjustments. As China starts to build this water-conservation project, it will involve a lot of small hydro, which benefits rural development. This could mean that they find out small hydro is the solution. That is highly possible and, indeed, that should be the way to move forward. So I think the golden period for large hydropower projects will end in the next five or 10 years.

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