

GROUPED HYDROPOWER PLANTS IN CHONGQING, YUNNAN, SICHUAN AND GUIZHOU PROVINCES, P.R. CHINA MONITORING REPORT



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1 PROJECT DETAILS

1.1 Summary Description of Project

The Grouped Project consists of 95¹ individual hydropower plants with a total installed capacity of 215.71 MW, and the maximum installed capacity of an individual power plant is 14 MW. All projects are run-of-river hydropower stations, spread widely across the less developed rural areas of southwestern China, consisting of four provinces. Out of 95 hydropower plants, 9 projects are located in Yunnan, 67 in Chongqing, 13 in Sichuan and 6 in Guizhou Province. The entire Grouped Project complies with the VCS.

The project activity is expected to generate around 769,396 tCO₂e GHG emission reductions on an annual basis. There are 81 plants under the Grouped Project exporting electricity to the Central China Power Grid (CCPG), and 14 plants under the Grouped Project exporting electricity to the Southern China Power Grid (SCPG). By exporting electricity from a renewable energy source to the Central China Power Grid (CCPG) and to the Southern China Power Grid (SCPG), the project activity achieves greenhouse gas (GHG) emissions reductions by displacing electricity from fossil fuel based power plants connected to the grid.

According to VCS 2007.1, sampling should be carried out for a grouped project, and the sampling of a grouped project shall take account of any sub groups and associated activities within each sub group.

A sampling approach was applied to the Grouped Project according to the relevant Sampling Guidance by the VVB². Based on the geographical distribution situation of the hydropower plants under the proposed VCS Grouped project, the hydropower plants are separated into four subgroups: subgroup separately in Chongqing City, Sichuan Province, Yunnan Province and Guizhou Province. By considering the project amount within different sub-groups and classified scale of the project activity (i.e. installed capacity $\leq$ 5MW or $>$ 5MW), in the end, 19 projects of the total 95 hydropower plants under this Grouped project are sampled. The final sampling result is demonstrated in the table below:

Table 1-1

Grid	Province	Number of Projects	Number of Samples Required	Sampling Project Serial No.
Central China Power Grid (CCPG)	Sichuan	13	4	78, 82, 85, 86
	Chongqing	67	10	21, 37, 55, 57, 59, 62, 63, 65, 67, 69

¹ Previously there were 98 hydropower plants included in the grouped project, three hydropower plants (17_Luotian, 19_Baidongyan and 89_Dashi Stage I) have been withdrawn from the grouped project according to the agreement between VVB and the project proponents during the validation processes, with the projects serial numbers remaining unchanged. Please see details in the VCS PD.

² For details please refer to section 3.2 of the validation report.

Southern China Power Grid (SCPG)	Yunnan	9	3	90, 94, 95
	Guizhou ³	6	2	72, 75
Total Number of Projects		95	N/A	-
Total Number of Samples Required		N/A	19	-

Based on the main characteristics of the Grouped project, such as the geographical distribution, to which power grid the electricity is supplied, project type and similarity, installed capacity of the individual project and so on, the sampling projects are the most representative projects for the whole 95 projects under the Grouped project. Therefore, during the verification, only the sampling projects need to be verified and under completeness check.

1.2 Sectoral Scope and Project Type

The Grouped Project generates electricity from several micro and small-scale hydropower projects, which are all connected to the regional electricity grid. Each individual project activity within the Grouped Project has a total installed capacity of less than 15 MW, which is the limit for small-scale projects as per UNFCCC definition.

Based on the “Grouped Project” approach under the VCS, which uses the UNFCCC definitions for small scale CDM projects for the individual project activities, the project belongs to following UNFCCC sectoral scope and project type:

Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)

Project Type (i): Renewable energy projects

The project is a grouped project.

1.3 Project Proponent

Project owner/project proponent:

The Grouped Project has an individual project owner for each or a small number of hydropower stations.

Table 1-2

No.	Individual Project Title	Individual Project Owner Name
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³ The six individual projects in Guizhou Province under the grouped project (project numbers included: 70~75) have claimed zero emission reductions, because the monitoring data of these projects are not available during this monitoring period.

1	Zengfuyoujiang Hydroelectric Plant	Chongqing Fuling Zengfuyoujiang Hydroelectric Plant
2	Jianshitan Hydroelectric Plant	Chongqing Fuling Huanglong Hydroelectric Plant
3	Jinxing Hydroelectric Plant	Pengshui Runxi Jinxing Hydroelectric Plant of Fuling Chuandong Hydropower Co., Ltd.
4	Huzhong Hydroelectric Plant	Pengshui Shengda Hydropower Co., Ltd.
5	Chongqing Wanzhou Fengmu Hydroelectric Plant	Wanzhou Yongfa Water Conservancy Development Co., Ltd.
6	Chongqing Wanzhou Longdong Hydroelectric Plant	Wanzhou Yongfa Water Conservancy Development Co., Ltd.
7	Chongqing Wanzhou Dengta Hydroelectric Plant	Wanzhou Huiyin Hydropower Development Co., Ltd.
8	Chongqing Wanzhou Mayuexi Hydroelectric Plant	Wanzhou Ertunhe Hydropower Development Co., Ltd.
9	Chongqing Wanzhou Xiaolong Hydroelectric Plant	Wanzhou Xiaolong Hydropower Development Co., Ltd.
10	Chongqing Wanzhou Yihe Hydroelectric Plant	Wanzhou Fengyu Hydropower Development Co., Ltd.
11	Chongqing Wanzhou Tiande Hydroelectric Plant	Chongqing Wanzhou Electric Development Co., Ltd.
12	Chongqing Wanzhou Puziling Hydroelectric Plant	Wanzhou Zhende Hydropower Development Co., Ltd.
13	Chongqing Wanzhou Yanshan Hydroelectric Plant	Wanzhou Yanshan Hydropower Development Co., Ltd.
14	Chongqing Wanzhou Lianmeng Hydroelectric Plant	Wanzhou Lianmeng Hydropower Equipments Co., Ltd.
15	Chongqing Wanzhou Wanlin Hydroelectric Plant	Wanzhou Wanlin Hydroelectric Plant
16	Chongqing Wanzhou Gaodongzi Hydroelectric Plant	Wanzhou Rongchuan Hydropower Development Co., Ltd.
18	Chongqing Wanzhou Yanjingxi Hydroelectric Plant	Wanzhou Zhende Hydropower Development Co., Ltd.

20	Chongqing Wanzhou Dibao Hydroelectric Plant	Wanzhou Runfeng Hydropower Development Co., Ltd.
21	Chongqing Wanzhou Xianfeng Hydroelectric Plant	Chongqing Wanzhou Xianfeng Hydroelectric Plant
22	Heba Hydroelectric Plant	Wulong Chepanchengmendong Hydroelectric Plant
23	Sandaoguai Hydroelectric Plant	Wulong Yajiang Longbao Hydroelectric Plant
24	Beiya Hydroelectric Plant	Wulong Runlong Maintenance Company
25	Wulong Guanqiao Hydroelectric Plant	Wulong Guanqiao Hydroelectric Plant
26	Xiangyang Stage II Hydroelectric Plant	Wulong Runlong Maintenance Company
27	Qingtongxi Hydroelectric Plant	Wulong Qingtongxi Hydroelectric Plant
28	Heping Hydroelectric Plant	Wulong Heping Hydroelectric Plant
29	Guanziya Hydroelectric Plant	Wulong Guanziya Hydroelectric Plant
30	Baiyangping Hydroelectric Plant	Wulong Hongchao Hydropower Development Co., Ltd.
31	Chengmendong Hydroelectric Plant	Wulong Chepanchengmendong Hydroelectric Plant
32	Shuanglong Hydroelectric Plant	Wulong Tukan Shuanglong Hydroelectric Plant
33	Chushuitang Hydroelectric Plant	Wulong Chushuitang Hydroelectric Plant
34	Shuangqiao Hydroelectric Plant	Wulong Shuangqiao Hydroelectric Plant
35	Shiqiao Hydroelectric Plant	Wulong Longyuan Science & Technology Development Co., Ltd.
36	Shuanglian Hydroelectric Plant	Wulong Boneng Electric Power Co., Ltd.
37	Baijia Hydroelectric Plant	Wulong Boneng Electric Power Co., Ltd.
38	Xinqiao Hydroelectric Plant	Wulong Boneng Electric Power Co., Ltd.

39	Luchi Hydroelectric Plant	Wulong Luchi Hydroelectric Plant
40	Xiangyang Stage III Hydroelectric Plant	Wulong Runlong Maintenance Company
41	Xiangyun Hydroelectric Plant	Wulong Xiangyun Hydroelectric Plant
42	Hongshan Hydroelectric Plant	Wulong Houping Hongshan Hydroelectric Plant
43	Leyuan Hydroelectric Plant	Wulong Leyuan Hydropower Co., Ltd.
44	Yong'an Hydroelectric Plant	Wulong Haiheng Agriculture Co., Ltd.
45	Suokousi Hydroelectric Plant	Wulong Suokousi Hydroelectric Plant
46	Xinli Hydroelectric Plant	Wulong Canggou Xinli Hydropower Plant
47	Caijiagou Stage III Hydroelectric Plant	Chongqing Wulong Jiangliu Hydroelectric Plant
48	Xiangyang Stage I Hydroelectric Plant	Wulong Runlong Maintenance Company
49	Cheqingyan Hydroelectric Plant	Wulong Yuanquan Hydropower Co., Ltd.
50	Lianghekou Hydroelectric Plant	Wulong Lianghekou Hydroelectric Plant
51	Wuhe Hydroelectric Plant	Wulong Wuhe Hydroelectric Plant
52	Sihe Hydroelectric Plant	Wulong Sihe Hydroelectric Plant
53	Shilingyan Hydroelectric Plant	Wulong Pingqiaoshilingyan Hydroelectric Plant
54	Nanmu Hydroelectric Plant	Wulong Nanmu Hydroelectric Plant
55	Canglong Hydroelectric Plant	Wulong Canglong Hydropower Co., Ltd.
56	Daheba Hydroelectric Plant	Wulong Dexin Hydropower Development Co., Ltd.
57	Heixigou Hydroelectric Plant	Wulong Landi Hydropower Co., Ltd.

58	Yanchanghe Stage III Hydroelectric Plant	Wulong Longfeng Hydropower Co., Ltd.
59	Muzonghe Stage IV Hydroelectric Plant	Wulong Landi Hydropower Co., Ltd.
60	Dengta Hydroelectric Plant	Wulong Jiayuan Hydropower Development Co., Ltd.
61	Banqiao Stage II Hydroelectric Plant	Wulong Haolong Hydropower Plant
62	Shuangchahe Hydroelectric Plant	Wulong Shuangchahe Hydroelectric Plant
63	Songshigou Hydroelectric Plant	Wulong Tukan Songshigou Hydroelectric Plant
64	Banqiao Stage III Hydroelectric Plant	Wulong Haoyun Hydropower Co., Ltd.
65	Shujiahe Hydroelectric Plant	Wulong Zili Electric Power Co., Ltd.
66	Yangyan Hydroelectric Plant	Wulong Sanyuan Hydroelectric Power Development Co., Ltd.
67	Baiguo Hydroelectric Plant	Chongqing Wulong Yuxiang Water Resource Development Co., Ltd.
68	Longqiao Hydroelectric Plant	Wulong Yongxin Hydropower Development Co., Ltd.
69	Baiyang Hydroelectric Plant	Chongqing Wulong Yuxiang Water Resource Development Co., Ltd.
70	Xinmin Tailwater Stage II Hydroelectric Plant	Daozhenxianghe Hydropower Development Co., Ltd.
71	Dongliuhe Hydroelectric Plant	Wulong Boneng Electric Power Co., Ltd.
72	Dahegou Hydroelectric Plant	Chongqing Fengyuanjinhui Hydropower Development Co., Ltd.
73	Xinmin Stage II Hydroelectric Plant	Wulong Yuqian Comprehensive Development Co., Ltd.

74	Guizhou Province Xingyi City Puti Hydropower Plant Technical Reform Project	Xingyi City Puti Power Co. Ltd
75	Guizhou Province Xingyi City Puti 2nd Stage (Xiniutang) Hydropower Plant Technical Reform Project	Xingyi City Puti Power Co. Ltd.
76	Wumaxi StageIHydroelectric Plant	Yingjing County Sanhe Township Wumaxi StageI Hydroelectric Station
77	Mozigou Hydroelectric Plant	Yingjing Sanhe Mozigou Hydroelectric Plant
78	Mayihe Hydroelectric Plant	Yingjing Mayihe Hydropower Station
79	Jinyatan Hydroelectric Plant	Yingjing Jinyatan Hydroelectric Plant
80	Toudaoshui Hydroelectric Station	Yingjing County Toudaoshui Hydroelectric Station
81	Sanhui Hydroelectric Plant	Sichuan Yingjing Sanhui Electric Power Co., Ltd.
82	Qingshuihe Stage I Hydroelectric Plant	Sichuan Yingjing Yunwushan Hydropower Co., Ltd.
83	Gongjiagou Hydroelectric Plant	Shimian Zhongxin Electric Power Development Co., Ltd.
84	Chahe Stage III Hydroelectric Plant	Sichuan Yingjing Hengyuan Electric Power Co., Ltd.
85	Daihuanggou Hydroelectric Plant	Yingjing County Sanhe Daihuanggou Hydroelectric Plant
86	Gaoqiaohe Hydroelectric Plant	Sichuan Yingjing Gaoqiaohe Electric Power Co., Ltd.
87	Zhuyeshan Hydroelectric Plant	Sichuan E'bian Heizhugou Hydropower Co., Ltd.
88	Lianghekou Hydroelectric Plant	E'bian Longxin Electric Power Co., Ltd.
90	Dabaishu Hydroelectric Plant	Lingcang Runda Hydropower Co., Ltd.

91	Dashi Stage III Hydroelectric Plant	Lingcang Runda Hydropower Co., Ltd.
92	Dashi Stage II Hydroelectric Plant	Lingcang Runda Hydropower Co., Ltd.
93	Yunnan Midu County Taishanhe Hydropower Station	Midu County Taishan Power Co., Ltd.
94	Zhenyuan County Xiaojiehe Hydropower Station	Zhenyuan Yi, Hani and Lahu Autonomous County Xiaojiehe Hydropower Co., Ltd.
95	Jinghong City Chuangye Hydropower Station	Xishuangbanna Chuangye Hydropower Development Co., Ltd.
96	Yingjiang Husa River 5th Stage Hydropower Plant	Yingjiang County Tianchao Hydropower Co. Ltd.
97	Yunnan Province Jinping County Mengqiao Village Datan Hydropower Station	Jinping Mengqiao Datan Electricity Co. Ltd.
98	Fugong County Lishadi Hydropower Plant Project	Yunnan Fugong Huatai Electricity Development Co. Ltd

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1.4 Other Entities Involved in the Project

No any other entities are involved in the project.

1.5 Project Start Date

Project start date: March 2002 (date of the earliest start date of an individual project)

1.6 Project Crediting Period

The starting date of the crediting period of the project activity is 28 March 2006 and the end date is 27 March 2016. The total number of years: 10 years.

It is a renewable crediting period and can be renewed twice.

1.7 Project Location

Based on the geographical distribution situation of the hydropower plants under the proposed VCS Grouped project, the hydropower plants are separated into four subgroups: subgroup separately in Chongqing City, Sichuan Province, Yunnan Province and Guizhou Province. Maps of the four provinces Chongqing, Sichuan, Yunnan, and Guizhou indicating the individual project locations are provided below. The exact geographic location of each hydropower plants under the Grouped project are all provided in the Table 1-3, and all these geographic coordinates data are from the real measurement data by the intermediaries with GPS measuring tools.

Table 1-3

Project No.	Project Title	Geographical Coordinates
1	Zengfuyoujiang Hydroelectric Plant	N 29°32'23.12" E 107° 0'17.29"
2	Jianshitan Hydroelectric Plant	N 29°17'14.67" E 107° 8'18.20"
3	Jinxing Hydroelectric Plant	N 29°39'24.68" E 108°12'19.73"
4	Huzhong Hydroelectric Plant	N 29°25'1.30" E 108° 5'15.67"
5	Chongqing Wanzhou Fengmu Hydroelectric Plant	E 108°48'45" N 30°32'19"
6	Chongqing Wanzhou Longdong Hydroelectric Plant	E 108°50'15" N 30°36'37"
7	Chongqing Wanzhou Dengta Hydroelectric Plant	E 108°39'30" N 30°38'11"
8	Chongqing Wanzhou Mayuexi Hydroelectric Plant	E 108°15'56" N 30°37'51"
9	Chongqing Wanzhou Xiaolong Hydroelectric Plant	E 108°47'49" N 30°34'59"
10	Chongqing Wanzhou Yihe Hydroelectric Plant	E 108°44'04" N 30°41'42"
11	Chongqing Wanzhou Tiande Hydroelectric Plant	E 108°24'18" N 30°38'5"
12	Chongqing Wanzhou Puziling Hydroelectric Plant	E 108°49'30" N 30°36'08"
13	Chongqing Wanzhou Yanshan Hydroelectric Plant	E 108°19'38" N 30°33'57"
14	Chongqing Wanzhou Lianmeng Hydroelectric Plant	E 108°04'35" N 30°41'27"
15	Chongqing Wanzhou Wanlin Hydroelectric Plant	E 107°59'41" N 30°46'62"
16	Chongqing Wanzhou Gaodongzi Hydroelectric Plant	E 108°25'49" N 30°45'19"
18	Chongqing Wanzhou Yanjingxi Hydroelectric	E 108°51'08"

	Plant	N 30°38'11"
20	Chongqing Wanzhou Dibao Hydroelectric Plant	E 108°54'00" N 30°41'27"
21	Chongqing Wanzhou Xianfeng Hydroelectric Plant	E 108°41'15" N 30°33'15"
22	Heba Hydroelectric Plant	N 29°19'10.40" E 107°37'32.49"
23	Sandaoguai Hydroelectric Plant	N 29°27'58.76" E 107°22'42.11"
24	Beiya Hydroelectric Plant	N 29°21'32.47" E 107°38'30.24"
25	Wulong Guanqiao Hydroelectric Plant	N 29°24'34.60" E 107°49'54.15"
26	Xiangyang Stage II Hydroelectric Plant	N: 29°24'52.67" E: 107°53'36.16"
27	Qingtongxi Hydroelectric Plant	N 29°28'14.97" E 108°00'48.54"
28	Heping Hydroelectric Plant	N 29°21'10.84" E 107°39'10.98"
29	Guanziya Hydroelectric Plant	N 29°22'16.92" E 107°45'14.34"
30	Baiyangping Hydroelectric Plant	N 29°26'7.04" E 107°39'41.32"
31	Chengmending Hydroelectric Plant	N 29°18'46.28" E 107°37'32.28"
32	Shuanglong Hydroelectric Plant	N 29°25'32.33" E 107°40'6.82"
33	Chushuitang Hydroelectric Plant	N 29°32'17.48" E 107°56'34.68"
34	Shuangqiao Hydroelectric Plant	N 29°32'12.41" E 107°57'10.41"
35	Shiqiao Hydroelectric Plant	N 29°10'35.75" E 107°48'48.45"
36	Shuanglian Hydroelectric Plant	N 29°25'29.10" E 108° 02'6.13"
37	Baijia Hydroelectric Plant	N 29°33'56.74" E 108°01'40.13"
38	Xinqiao Hydroelectric Plant	N 29°31'43.50" E 108° 1'16.73"
39	Luchi Hydroelectric Plant	N 29°23'25.72" E 107°38'10.45"
40	Xiangyang Stage III Hydroelectric Plant	N 29°24'6.59" E 107°53'7.37"
41	Xiangyun Hydroelectric Plant	N 29°22'25.91" E 107°38'37.84"
42	Hongshan Hydroelectric Plant	N 29°35'55.57" E 108° 2'25.20"
43	Leyuan Hydroelectric Plant	N 29°20'50.95" E 107°35'34.32"
44	Yong'an Hydroelectric Plant	N 29°20'32.46" E 107°38'33.45"
45	Suokousi Hydroelectric Plant	N 29°24'55.81" E 107°41'19.75"
46	Xinli Hydroelectric Plant	N 29°26'35.99"

		E 107°58'15.50"
47	Caijiagou Stage III Hydroelectric Plant	N 29°13'27.65" E 107°39'16.46"
48	Xiangyang Stage I Hydroelectric Plant	N 29°25'22.02" E 107°53'27.70"
49	Cheqingyan Hydroelectric Plant	N 29°16'1.31" E 107°28'25.89"
50	Lianghekou Hydroelectric Plant	N 29°15'41.20" E 107°41'39.47"
51	Wuhe Hydroelectric Plant	N 29°31'46.40" E 107°51'53.96"
52	Sihe Hydroelectric Plant	N 29°31'52.23" E 107°52'13.95"
53	Shilingyan Hydroelectric Plant	N 29°20'52.64" E 107°22'41.42"
54	Nanmu Hydroelectric Plant	N 29°33'09.43" E 108°01'28.06"
55	Canglong Hydroelectric Plant	N 29°15'0.97" E 107°40'50.22"
56	Daheba Hydroelectric Plant	N 29°11'18.40" E 107°41'23.72"
57	Heixigou Hydroelectric Plant	N 29°27'19.93" E 108° 0'33.33"
58	Yanchanghe Stage III Hydroelectric Plant	N 29°30'02.34" E 107°55'27.63"
59	Muzonghe Stage IV Hydroelectric Plant	N 29°27'22.13" E 108° 0'37.04"
60	Dengta Hydroelectric Plant	N 29°15'45.45" E 107°38'33.03"
61	Banqiao Stage II Hydroelectric Plant	N 29°14'18.52" E 107°39'1.97"
62	Shuangchahe Hydroelectric Plant	N 29°18'16.75" E 107°43'02.48"
63	Songshigou Hydroelectric Plant	N 29°23'41.02" E 107°40'40.05"
64	Banqiao Stage III Hydroelectric Plant	N 29° 5'57.09" E 107°40'40.56"
65	Shujiahe Hydroelectric Plant	N 29°20'0.27" E 107°45'39.81"
66	Yangyan Hydroelectric Plant	N 29°27'46.67" E 107°22'55.58"
67	Baiguo Hydroelectric Plant	N 29°23'40.76" E 107°47'15.62"
68	Longqiao Hydroelectric Plant	N 29° 1'33.00" E 107°44'33.27"
69	Baiyang Hydroelectric Plant	N 29°19'20.81" E 107°47'37.19"
70	Xinmin Tailwater Stage II Hydroelectric Plant	N 29° 0'19.33" E 107°46'1.32"
71	Dongliuhe Hydroelectric Plant	Stage 1: N 29° 8'14.40" E 107°43'46.80" Stage 2: N 29° 6'45.46" E 107°44'22.46" Stage 3: N 29° 5'42.15" E 107°44'33.75"

		Stage 4: N 29° 4'52.89" E 107° 43'34.06"
72	Dahegou Hydroelectric Plant	N 28° 49'14.23" E 107° 8'46.24"
73	Xinmin Stage II Hydroelectric Plant	N 28° 59'50.15" E 107° 46'50.89"
74	Guizhou Province Xingyi City Puti Hydropower Plant Technical Reform Project	N 25° 10'21" E 104° 43'55"
75	Guizhou Province Xingyi City Puti 2nd Stage (Xiniutang) Hydropower Plant Technical Reform Project	N 25° 07'45" E 104° 41'56"
76	Wumaxi Stage I Hydroelectric Plant	N 29° 40'18" E 102° 32'30"
77	Mozigou Hydroelectric Plant	N 29° 45'25.84" E 102° 27'13.95"
78	Mayihe Hydroelectric Plant	N 29° 42'58" E 102° 33'12"
79	Jinyatan Hydroelectric Plant	N 29° 40'4.94" E 102° 43'29.55"
80	Toudaoshui Hydroelectric Station	N 29° 42'41" E 102° 33'31"
81	Sanhui Hydroelectric Plant	N 29° 43'28" E 102° 36'10"
82	Qingshuihe Stage I Hydroelectric Plant	N 29° 36'21" E 102° 45'43"
83	Gongjiagou Hydroelectric Plant	N 29° 22'19.82" E 102° 2'25.10"
84	Chahe Stage III Hydroelectric Plant	N 29° 48'09" E 102° 28'46'
85	Daihuanggou Hydroelectric Plant	N 29° 44'38.82" E 102° 25'56.62"
86	Gaoqiaohe Hydroelectric Plant	N 29° 36'13" E 102° 44'4"
87	Zhuyeshan Hydroelectric Plant	N 29° 02'22.71" E 103° 01'36.51"
88	Lianghekou Hydroelectric Plant	N 29° 09'46.2" E 103° 05'35.7"
90	Dabaishu Hydroelectric Plant	N 24° 23'23.15" E 100° 08'42.08"
91	Dashi Stage III Hydroelectric Plant	N 24° 21'11.25" E 100° 06'25.21"
92	Dashi Stage II Hydroelectric Plant	N 24° 24'11.31" E 100° 08'55.01"
93	Yunnan Midu County Taishanhe Hydropower Station	N 24° 56'24" E 100° 42'20"
94	Zhenyuan County Xiaojiehe Hydropower Station	N 24° 00'18" E 101° 16'57"
95	Jinghong City Chuangye Hydropower Station	N 22° 04'38" E 100° 42'31"
96	Yingjiang Husa River 5th Stage Hydropower Plant	N 24° 31'11" E 97° 44'25"
97	Yunnan Province Jinping County Mengqiao Village Datan Hydropower Station	N 22° 55'31" E 103° 4'31"
98	Fugong County Lishadi Hydropower Plant	N 27° 16'20"

	Project	E 98°53'50"
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As can be seen in Figure 1-1, and Figure 1-2 for Chongqing Province, 15 hydropower stations are located in Wanzhou County along the Northeast direction from Chongqing city (project numbers included: 5~16, 18, 20~21), whereas 52 hydropower stations are located in Wulong County to the Southeast of Chongqing (project numbers included: 1~4, 22~69).



Figure 1-1 Chongqing Municipality City in China

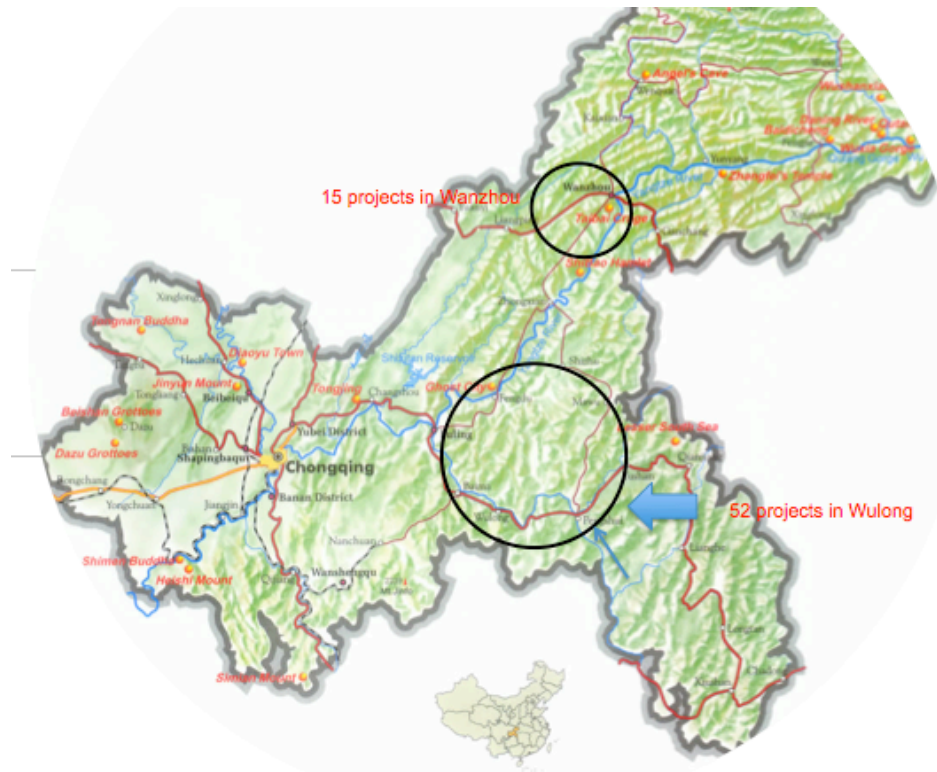


Figure 1-2 Hydropower Plants in Chongqing City

As shown in Figure 1-3 and Figure 1-4, 2 hydropower stations are located in Ebian County (project numbers included: 87, 88) and 11 in Ya'an County within Sichuan province, southwest of Sichuan's capital city Chengdu (project numbers included: 76~86).



Figure 1-3 Sichuan Province in China



Figure 1-4 Hydropower Plants in Sichuan Province

Figure 1-5 and 1-6 shows 9 power stations in Yunnan Province (project numbers included: 90~98), sparsely distributed throughout the entire province with borders to Myanmar, Laos and Vietnam.



Figure 1-5 Yunnan Province in China



Figure 1-6 Hydropower Plants in Yunnan Province

Figure 1-7 and Figure 1-8 indicates 6 project locations in Guizhou province (project numbers included: 70~75).



Figure 1-7 Guizhou Province in China



Figure 1-8 Hydropower Plants in Guizhou Province

1.8 Title and Reference of Methodology

As per Appendix B of the UNFCCC's "Simplified modalities and procedures for small-scale clean development mechanism project activities", following approved small-scale CDM methodology is applied to the Project:

Project Type (i): Renewable energy projects

Project Category/Methodology: AMS-I.D. – Grid connected renewable electricity generation (Version 13, 14th December 2007, EB 36)

For more information about the methodology, please refer to the following website:
<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved>

For the calculation of the combined margin baseline emission factor, the approved "Tool to calculate the emission factor for an electricity system" (Version 1.1, EB 35) is used. For more information, please refer to the following link:
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf/history_view

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

During this monitoring period (from 14-6-2009 to 25-6-2011⁴), all the individual project activities under this Grouped project are operating normally and the implementation status is stable.

Monitoring meters of some individual projects in Wulong County, Chongqing Province and in Ya'an County, Sichuan Province have been replaced during this monitoring period. Detailed meters replacement information of the sampling projects in these regions is listed in the table below:

⁴ The 1st monitoring period of the grouped project is from 01-04-2006 to 05-06-2009. The 2nd monitoring period is from 14-06-2009 to 25-06-2011. There is no overlap between the first monitoring period and the second monitoring period.

It should be noted that as a grouped project, the project is a bundle of over 95 sub-projects. Among the 95 projects, there is different data coverage (due to different electricity settlement date between the project owner and the grid). The 1st monitoring period of the grouped project is from 01-04-2006 to 05-06-2009, and the corresponding monitoring data are covering the period from April 2006 to May 2009. The start date of "01-04-2006" is chosen based on the earliest available data from the sub-projects, and the end date of "05-06-2009" is chosen based on the last available data from the sub-projects.

Following the end of the first monitoring period, data starting from 06-06-2009 could be accounted for the 2nd monitoring period. However, as mentioned above settlement date varies among projects, (in fact, for most of the projects, the electricity settlement period for each month starts on the 26th of the previous month and ends on the 25th of the month concerned), to ensure there is no overlap with the first monitoring period, the settlement period that starts earlier than 06-06-2009 is excluded from the calculation. And only monitoring data based on settlement records that start later than 06-06-2009 can be taken into account. The earliest of the settlement records, which meet this requirement, is 14-06-2009. Hence, the second monitoring period is defined as from 14-06-2009 to 25-06-2011, with the monitoring data covering the period from July 2009 to June 2011. This is also conservative.

Project No.	Project short title	Invoice meter change date	Invoice meter model number		Invoice meter serial no.		Invoice meter accuracy ⁵	
			old	new	old	new	old	new
21	Xianfeng ⁶	-	DSSD290-S	DSSD536	021960	254729	1	0.5S
37	Baijia	10 Oct 2010	DSSD331	DSSD71	200404352Q0049	6012584356	0.5	0.5S
57	Heixigou	15 Dec 2009	DSSD331	DSSD71	200404352Q0057	6012584355	0.5S	0.5S
59	Muzonghe IV	15 Dec 2009	DSSD71	DSSD71	6012099414	6012584359	0.5S	0.5S
62	Shuangchahe	27 Oct 2010	DSSD331	ZFH405	20070225020122	10099436	0.2	0.5S
63	Songshigou	8 Sep 2010	DSF32	ZFH405	50113200126-2	10099435	1	0.5S
65	Shujiahe	24 Sep 2010	DSSD331	DSSD71	200404352Q0064	6012693630	0.2	0.5S
67	Baiguo	24 Oct 2010	DSSD581 XF	DSSD71	2001-498164	6012765144	0.5	0.5S
69	Baiyang	24 Oct 2010	DSSD581 XFT	DSSD71	292444	6012693715	0.5	0.5S
78	Mayihe	19 May 2011	DSF32	DSSD331	50113401324-2	09110204330092	1	1
82	Yunwushan	14 Jan 2010	DSF32	DSSD331	50123400293-2	09110204330098	2	1
85	Daihuanggou	28 Apr 2011	DSF32	DSSD331	50113402392-2	10010237920004	1	1
86	Gaoqiaohe	3 Feb 2010	DSF32	DSSD331	50153500001-2	09110204330008	0.5	1

⁵ Although some of the meter accuracies have been changed after meter replacement, all the meter accuracies still meet the requirements of Technical Administrative Code of Electric Energy Metering (DL/T 448-2000): The level of accuracy for Type IV active electricity energy meter should not be less than 2.0.

According to DL/T 448-2000: Type III Electric Energy Metering Device should be applied to customers with monthly average electricity consumption no less than 100,000 kWh ($\geq 100,000$ kWh), or with transformer capacity no less than 315 kVA (≥ 315 kVA); to electricity generator or electricity-generating plants with capacity less than 100 MW (< 100 MW) for electricity measurement; and to assess active electricity balance on electricity transmission line with voltage no less than 110 kV (≥ 110 kV). And then, Type IV Device should be applied to customers with transformer capacity less than 315 kVA (< 315 kVA), to electricity plants with capacity less than 100 MW (< 100 MW), and to transmission line with voltage less than 110 kV (< 110 kV).

As to the individual small hydropower plants under the grouped project, whose monitoring meters have been replaced during this monitoring period, their installed capacity are ranging from 0.1 MW to 9.6 MW (all far lower than 100 MW), and the transmission line with voltage are all lower than 110 kV (most are 10 kV or 35 kV). Therefore, Type IV Electric Energy Metering Device has already been able to meet the requirement for monitoring and measurement for these projects. In this case, meter accuracies before and after meter replacement all meet the requirement of DL/T 448-2000 for Type IV Device.

⁶ The monitoring meter of 21_Xianfeng project has never been changed during the first and second monitoring periods (from 01-04-2006 to 25-06-2011). However, due to incorrect monitoring meter information from another meter photo was used, incorrect meter information was written in the previous monitoring report for the first monitoring period. Here, the correct meter information has been presented (DSSD536, 254729, 0.5S). Illustration letters issued by the local grid company and the project owner respectively have been provided for clarification.

No events or situations that occurred during the monitoring period, which may impact the GHG emission reductions or removals and monitoring.

2.2 Deviations from the Monitoring Plan

No deviation from the Monitoring Plan.

2.3 Grouped Project

There is no new instance of the project activity included under this Grouped project during this monitoring period.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Date and parameters of Southern China Power Grid (SCPG) that are available at validation, required for estimating the baseline grid emission factor.

Data Unit / Parameter:	EF _{SCPG,y}
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh) (2004-2006, Southern China Power Grid)
Source of data:	China Electric Power Yearbook 2005-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating the OM and BM
Any comment:	-

Data Unit / Parameter:	Electricity Imports from Connected Electricity Systems to Southern China Power Grid
Data unit:	MWh
Description:	Electricity Imports from Connected Electricity Systems to Southern China Power Grid in (years) y (2004-2006)
Source of data:	China Electric Power Yearbook 2005-2007
Value applied:	Provided in Annex I of the PD

Purpose of the data:	Used for calculating the OM
Any comment:	-

Data Unit / Parameter:	$FC_{i,y}$
Data unit:	$10^4 t / 10^8 m^3$
Description:	Amount of fuel i consumed in the project electricity system in year y (2004-2006, Southern China Power Grid)
Source of data:	China Energy Statistics Yearbook 2005-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	$NCV_{i,y}$
Data unit:	MJ/t, km ³
Description:	Net calorific value per mass or volume unit of fuel i
Source of data:	China Energy Statistics Yearbook 2006
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	$EF_{CO_2,i,y}$
Data unit:	tCO ₂ /TJ
Description:	CO ₂ emission factor per energy unit of fuel i
Source of data:	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	Efficiency level of best technology commercially available in China for coal-fired power generation
Data unit:	%
Description:	Efficiency level of best technology commercially available in China for coal-fired power generation
Source of data:	China DNA: Notification on Determining the Regional Grid Emission Factors of China
Value applied:	37.28%
Purpose of the data:	Used for calculating BM
Any comment:	-

Data Unit / Parameter:	Efficiency level of best technology commercially available in China for oil and gas-fired power generation
Data unit:	%
Description:	Efficiency level of best technology commercially available in China for oil and gas-fired power generation
Source of data:	China DNA: Notification on Determining the Regional Grid Emission Factors of China
Value applied:	48.81%
Purpose of the data:	Used for calculating BM
Any comment:	-

Data Unit / Parameter:	$CAP_{j,y}$
Data unit:	MW
Description:	The installed capacity of power generation sources j in the Southern China Power Grid in (years) y (2004-2006, Southern China Power Grid)

Source of data:	China Electric Power Yearbook 2005-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating BM
Any comment:	-

Data Unit / Parameter:	EF _{Res}
Data unit:	gCO ₂ eq/kWh
Description:	Default emission factor for emissions from reservoirs
Source of data:	ACM0002 Version 10
Value applied:	90
Purpose of the data:	Used for calculating project emission
Any comment:	-

Date and parameters of Central China Power Grid (CCPG) that are available at validation, required for estimating the baseline grid emission factor.

Data Unit / Parameter:	EG _{CCPG,y}
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in (years) y (2004-2006, China Central Power Grid)
Source of data:	China Electric Power Yearbook 2000-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	Electricity Imports from Connected Electricity Systems to Central China Power Grid
Data unit:	MWh

Description:	Electricity Imports from Connected Electricity Systems to Central China Power Grid in (years) y (2004-2006)
Source of data:	China Electric Power Yearbook 2000-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM
Any comment:	-

Data Unit / Parameter:	$FC_{i,y}$
Data unit:	$10^4 t / 10^8 m^3$
Description:	Amount of fuel i consumed in the project electricity system in (years) y (2004-2006, Central China Power Grid)
Source of data:	China Energy Statistics Yearbook 2005-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	$NCV_{i,y}$
Data unit:	$TJ / 10^3 t$
Description:	Net calorific value per mass or volume unit of fuel i
Source of data:	China Energy Statistics Yearbook 2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	$EF_{CO_2,i,y}$
Data unit:	tCO_2 / TJ
Description:	CO2 emission factor per energy unit of fuel i
Source of data:	Revised 2006 IPCC Guidelines for National

	Greenhouse Gas Inventories
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating OM and BM
Any comment:	-

Data Unit / Parameter:	Efficiency level of best technology commercially available in China for coal-fired power generation
Data unit:	%
Description:	Efficiency level of best technology commercially available in China for coal-fired power generation
Source of data:	China DNA: Notification on Determining the Regional Grid Emission Factors of China
Value applied:	37.28%
Purpose of the data:	Used for calculating BM
Any comment:	-

Data Unit / Parameter:	Efficiency level of best technology commercially available in China for oil and gas-fired power generation
Data unit:	%
Description:	Efficiency level of best technology commercially available in China for oil and gas-fired power generation
Source of data:	China DNA: Notification on Determining the Regional Grid Emission Factors of China
Value applied:	48.81%
Purpose of the data:	Used for calculating BM
Any comment:	-

Data Unit / Parameter:	CAP _{Total,y}
Data unit:	MWh

Description:	The total capacity addition of the selected period in which approximately 20% capacity has been added to the grid in (years) y (2000-2007, Central China Power Grid)
Source of data:	China Electric Power Yearbook 2000-2007
Value applied:	Provided in Annex I of the PD
Purpose of the data:	Used for calculating BM
Any comment:	-

3.2 Data and Parameters Monitored

Data and parameters monitored for individual project activities exporting electricity to Southern China Power Grid:

Data Unit / Parameter:	EG _{Export,y}
Data unit:	MWh/y
Description:	The accumulated net electricity exported to the Southern China Power Grid by all the hydropower plants under the Grouped project located in Yunnan and Guizhou Provinces in the year y
Source of data:	Measured by meters
Description of measurement methods and procedures to be applied:	Measured continuously by kilowatt-hours meters and recorded on a monthly basis by monitoring personnel.
Frequency of monitoring/recording:	Measured continuously and recorded on a monthly basis
Value monitored:	The electricity exported to the SCPG by the Grouped project is 327,126.366 MWh during this monitoring period.
Monitoring equipment:	The detailed information including type, accuracy class, serial number of the monitoring equipment is provided in Section 5.1.
QA/QC procedures to be applied:	- The exported electricity to the grid is measured by kilowatt-hours meters (Gateway meters), which are installed on the property rights division points, and are appointed by the Power Purchase Agreements - Trained and qualified staff is responsible for

	recording electricity export data from the kilowatt meters • Meters will be calibrated periodically according to relevant national standards • The data measured by meters will be crosschecked with electricity receipts, which is used as the basis of calculating electricity sales income. Considering possible limitations and errors in accounting or payment conversion, the more conservative amount shall be used, if there is a difference. • Only the net electricity exported to the grid shall be taken into account. This means the monitoring measurement method shall exclude the electricity imported by the project activity. • The net electricity exported will be verified by electricity receipts. • Calibration of the gateway meter (owned by the grid company) will be performed by a qualified entity in regular intervals.
Calculation method:	Only the net electricity export to the grid shall be taken into account. This means that the monitoring measurement method shall exclude electricity imported from the grid by the project activity and possible transmission losses.
Any comment:	-

Data and parameters monitored for individual project activities exporting electricity to Central China Power Grid:

Data Unit / Parameter:	EG _{Export,y}
Data unit:	MWh/y
Description:	The accumulated net electricity exported to the Central China Power Grid by all the hydropower plants under the Grouped project located in Chongqing City and Sichuan Province in the year y
Source of data:	Measured by meters
Description of measurement methods and procedures to be applied:	Measured continuously by kilowatt-hours meters and recorded on a monthly basis by monitoring personnel.
Frequency of monitoring/recording:	Measured continuously and recorded on a

	monthly basis
Value monitored:	The electricity exported to the CCPG by the Grouped project is 816,735.541 MWh during this monitoring period.
Monitoring equipment:	The detailed information including type, accuracy class, serial number of the monitoring equipment is provided in Section 5.1.
QA/QC procedures to be applied:	- The exported electricity to the grid is measured by kilowatt-hours meters (Gateway meters), which are installed on the property rights division points, and are appointed by the Power Purchase Agreements - Trained and qualified staff is responsible for recording electricity export data from the kilowatt meters - Meters will be calibrated periodically according to relevant national standards - The data measured by meters will be crosschecked with electricity receipts, which is used as the basis of calculating electricity sales income. Considering possible limitations and errors in accounting or payment conversion, the more conservative amount shall be used, if there is a difference. - Only the net electricity exported to the grid shall be taken into account. This means the monitoring measurement method shall exclude the electricity imported by the project activity. - The net electricity exported will be verified by electricity receipts. - Calibration of the gateway meter (owned by the grid company) will be performed by a qualified entity in regular intervals.
Calculation method:	Only the net electricity export to the grid shall be taken into account. This means that the monitoring measurement method shall exclude electricity imported from the grid by the project activity and possible transmission losses.
Any comment:	-

3.3 Description of the Monitoring Plan

The objective of the monitoring plan is to ensure the complete, consistent, clear, and accurate monitoring and calculation of emission reductions during the entire crediting period of the project activity. The project owners will be responsible for the implementation of the monitoring plan, and the grid company will cooperate with the project owners.

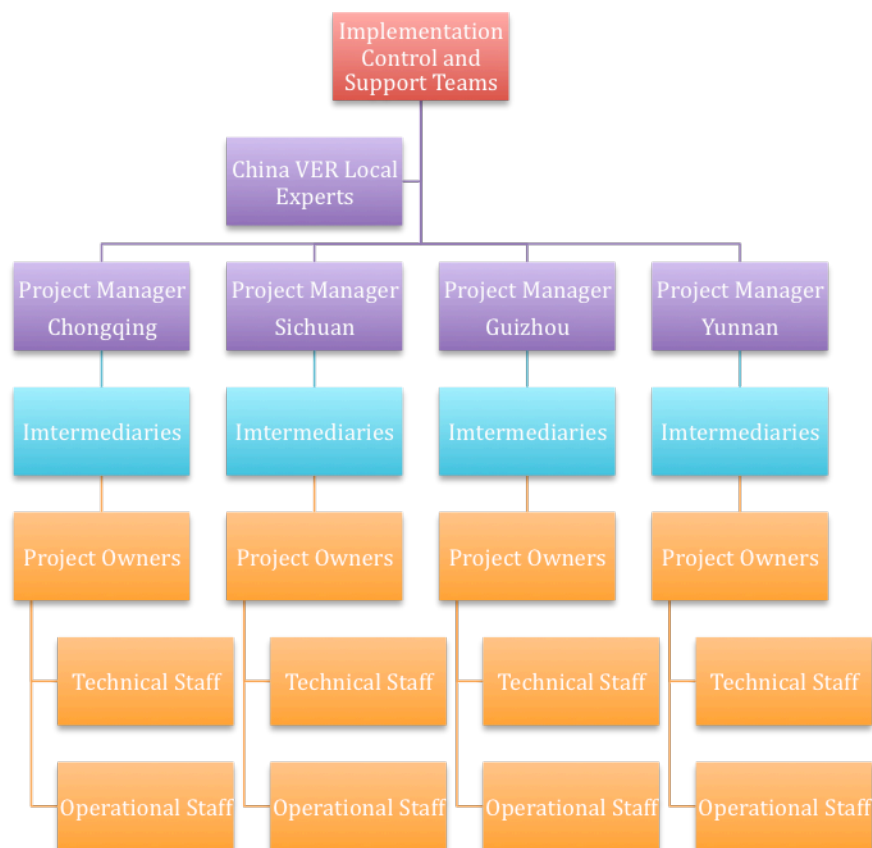
According to the VCS 2007.1, section 5.6, for a Grouped Project, a central GHG information system and control is associated with the project and its monitoring. South Pole Carbon Asset Management Ltd is setting up this central information system for this Grouped Project. South Pole is responsible for gathering and managing individual projects' information and their monitoring relevant documents. Each project owner sends monthly monitoring information and associated evidences to South Pole Carbon Asset Management Ltd. South Pole checks all documents and compiles the central monitoring report, which shows emission reductions per year for each individual hydropower plant under the Grouped Project. The monitoring report is then submitted to a qualified independent third party (VVB) which checks the correctness of the data by carrying out desk reviews of submitted documentation and conducting on-site spot checks for a randomly selected sample of projects.

The central GHG information system and control

As per VCS guidelines 2007.1, the central GHG information system was established to ensure accurate monitoring control and management of individual projects. The system will specify the organization, control and procedures required for certain key monitoring system features.

Monitoring Organizational Structure

Figure 3-1



The central GHG information system is based on a clear organization structure integrating functional units: projects owners, Intermediary companies, South Pole's China teams and our Global Quality Control and Technical Support Team. South Pole's Beijing implementation team,

which will allocate four project managers to the Grouped Project, is responsible for assessment of all relevant data and documents for the GHG information system and compilation of the Monitoring Report. Beijing senior VER experts undertake the initial quality check of the Monitoring Report compiled by the implementation team. VER experts are specialized in the VER methodology and also have local hydro electricity industry sector knowledge for a better assessment of the documents. Last but not least, the revised Monitoring Report will be revised by South Pole's central internal Quality Control and Technical Support team, ensuring compliance with VCS and related guidelines.

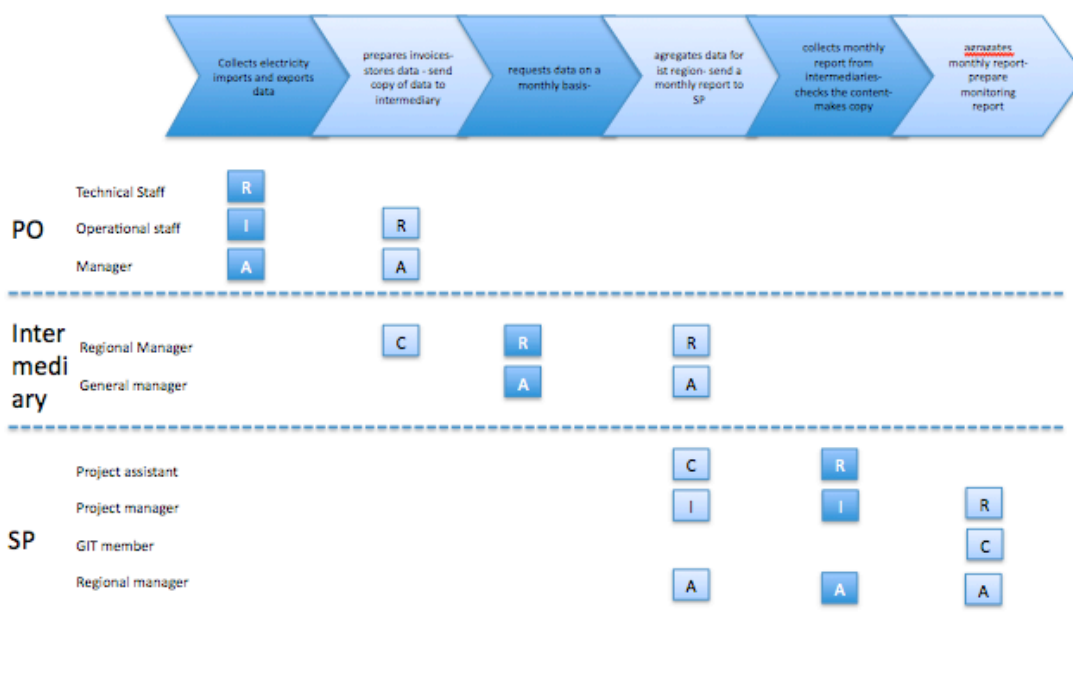
Project Monitoring Management Approach

South Pole brings a successful track record and a wealth of experience in the development of CDM methodologies, project and programme activities under CDM and the VCS. Team members include experienced local and international experts. Given the novelty of the Grouped Project approach, South Pole is putting together a team comprising senior experts with deep methodological and programme experience.

South Pole's internal quality check procedure follows strict and efficient practices in order to ensure that all deliverables meet its high quality standards. To this end it deploys the 'RACI' approach, which splits responsibilities for project management into four categories, as illustrated in Figure 3-2:

1. Responsible (R) – The team members who carry out the analyses and writing required to complete the task. In other words, who do the work to achieve the task
2. Accountable (A) – The team member who is accountable for the completion of the task. Accountable must sign off (Approve) on work that Responsible provides.
3. Consulted (C) – South Pole colleagues who are consulted during the completion of the tasks (two-way communication).
4. Informed (I) – South Pole colleagues who are kept up-to-date on progress (one-way communication) and should be notified of result.

Figure 3-2 Quality assurance process in project management at South Pole



To explain the graph more explicitly:

At the PO level, the monitoring team is responsible for gathering the data of the electricity generation daily and monthly from the electrical meters and also for sending the recorded electricity generation data to intermediaries. The following are the work break down for this monitoring process.

Responsible (Action 1, Operational staff): who do the electricity generation recording and collect electricity imports of the hydro power station.

(Action 2, Operational staff): who are also response to keep of copies of electricity generation monitoring data and also send them to the intermediaries between us.

Informed (Technical staff): operational staff of hydro power station who are kept up-to-date on electricity generation recording

Consulted (Manager): suggestions and opinions can be asked by both technical staffs and operational staffs regarding electricity generation monitoring.

Accountable (Action 1, Manager): the manager of the monitoring power station needs to approve the accuracy of the electricity generation monitoring results.

(Action 2, manager): the manager of the monitoring power station needs to make sure the accuracy of data transferring process between its organization and the intermediate.

At the intermediary level, intermediaries from the four project provinces are responsible for gathering EG data monthly from all the project owners and collaborate between SP and POs to ensure the quality of each steps of monitoring process.

Responsible (Action 1, regional manager of intermediaries), who need to request data from POs contracted with their organization.

(Action 2, regional manager of intermediaries), who need to aggregate EG data and send these to South Pole.

Accountable (Action 1&2, general manager of intermediaries), who are accountable and responsible for the action the regional manager delivers, i.e. action 1: request data from the POs and action 2: aggregate EG data and send these data to South Pole.

At South Pole level, the involvement of different level of organisation is there to make sure that the central information system is well-functioned. The following demonstrates the actions that South Pole's internal organisation delivered subjects to the RACI model.

1. interaction between intermediaries:

Consulted (Action 1, assistant project manager) Assistant project managers consult the intermediaries for the EG aggregation and make sure the aggregation is delivered subjects to relevant guidance and are eligible under VSC standard. Assistant project managers need to cross check with aggregation data that the intermediaries provided.

Informed (Action 2, local VER expert) Assistant project manager should inform the local VER experts the outcomes of the consultation with the intermediaries and any other communications regarding the grouped monitoring process.

Accountable (Action 1, regional manager) Regional managers are accountable for the above mentioned actions that assistant project managers and local VER experts deliver regarding the monitoring process.

2. monitoring process during internal at South Pole

Responsible (Action 1, assistant project managers) who are responsible for collecting monthly reports from intermediaries and make copies.

Informed (Action 2, local VER expert) Assistant project manager should inform the local VER experts the outcomes of EG data collection from intermediaries

Accountable (Action 1, regional manager) Regional managers are accountable for the above mentioned actions which assistant project managers and local VER experts deliver regarding the monitoring process.

Consulted (Action 2, ISC member), South Pole's ISC members provides their opinions and suggestions for the monitoring report.

Monitoring Roles and Responsibilities

The project proponents are involved for collecting the monitoring information, operation and maintenances. The structure is given below identifying job description for each parties involved.

Figure 3-3



Monitoring Procedures

Selection and management of the GHG data and information;

Table 3-1

Parameter	Source of data	Data	Management	Remark
EG (kWh)	Electronic measurement and monitored by Gateway meter	Local grid company Monthly Electricity Generation bill Electricity generation record/report/statement/produce by Project owner on the site project	The proper calibration of electronic meter is maintained by certified calibration entity and the O&M operator.	The electronic meter used for electricity generation measurement at substation are kept in custody, sealed, maintained by state electricity utility.

Processes for collecting, processing, consolidating and reporting GHG data and information;

Table 3-2

Data collection	Data	Data	Reporting GHG data	Information
-----------------	------	------	--------------------	-------------

	processing	consolidation		
The EG is jointly recorded by POs authority and electricity utilities every month	Onsite staff take record of the EG on a daily basis. Daily data are aggregated before the settlement with grid company. The EG by each project is process for issuing Electricity generation bill	Local grid company monthly bills or the EG records/reports are considered for GHG reduction calculation.	The monthly electricity generation bill, electricity or/and generation records/reports/statements are considered for reporting the GHG data	The measured electricity generated will be cross check with records (i.e. invoice) for sold electricity.

Site level monitoring guidance

The grid company and the project owners are responsible for operation and maintenance of their respective electricity meters. All parties guarantee that the measuring equipments are in good condition and completely sealed.

- (i) The project owner reads and checks the electricity meter and records the data periodically as a primary record of the amount of the electricity supplied to the grid;
- (ii) The project owner compiles the data recorded for the amount of electricity supplied to the grid in a monthly report and provides the monthly status sheet of electricity sales to the grid company;
- (iii) The grid company confirms the amount of exported electricity after verification and acceptance of the electricity data supplied by the project owner;
- (iv) The project owner provides an electricity sales invoice to the grid company according to the actual amount of electricity delivery reflected in the grid company's confirmation. A copy of the invoice is kept by the project owner;
- (v) The project owner keeps also copies of the status sheet of electricity sales to the grid company. The periodical records of the electricity meter's measurements are archived on paper.

If either the project owner or the grid company detects any distortion or mal-function of the electricity meter, it promptly informs the other party to jointly investigate and solve the problem.

If for some projects, either the project owner or the grid company detects any distortion or mal-function of the electricity meter, a conservative discount factor on the emission reductions from the projects shall be applied.

The meter reading will be readily accessible for the VVB carrying out the verification of monitoring data. The project owner will keep the calibration test records for verification.

Monitoring Equipment and program

According to Technical Administrative Code of Electric Energy Metering (DL/T448-2000), the electric energy metering equipment is properly configured, and is checked by the project owner and the grid company before the project is put into operation.

The electric energy metering equipments comprise an electric energy meter (or kilowatt meter) and other electric energy metering devices. The amount of electricity exported to and imported from the power grid is measured by the electric energy meter. The electric energy meter is installed at the physical metric point determined by both of the project owner and the grid company according to the electricity sales/purchase contract. The monitoring plan will utilize the measurement, which is used in the balance sheet of the grid company and is measured by the meter set up by the grid company.

The serial number, model number and calibrations of the monitoring meters for the sampling projects are listed in the tables below (please refer to Section 2.1 for detailed monitoring meters replacement information), the detailed information of the monitoring meters for each individual project under the Grouped Project (i.e. accuracy, installation position) is demonstrated in Section 5.1, and the monitoring flow diagrams for the sampling projects are demonstrated in Section 5.2.

In Table 3-3.1, the sampling projects with the calibration certificates for their invoice meters issued by the corresponding calibration entities are listed.

In Table 3-3.2, the sampling projects with the certification letters issued by the calibration entities are listed.

Two certification letters have been respectively issued by the local power grid companies (Chongqing City Wulong County Power Supply Limited Company and Chongqing Fuling Electric Power Industrial Co., Ltd.), who are also the calibration entities for the Table 3-3.2 listed sampling projects. Meters of projects, with the project numbers included 37, 57, 59, 65, 67 and 69, have been calibrated by Chongqing City Wulong County Power Supply Limited Company during this whole monitoring period. And meters of projects, with the project number included 55, 62 and 63, have been calibrated by Chongqing Fuling Electric Power Industrial Co., Ltd. during this whole monitoring period. The two letters confirm that all the invoice meters of these included projects have been calibrated and verified according to the relevant national regulations and standards (DL/T448-2000) during this whole monitoring period and all calibration results for invoice meters meet the required standards. Certified labels are posted on the calibrated meters.

All the calibrations for the monitoring meters of all sampling projects are valid during this whole monitoring period.

Table 3-3.1

Project No.	Project title	Meter Serial No.		Meter Model Number	Calibration Certificate Serial No.	Calibration Entity	Calibration Date	Calibration Valid Until
21	Chongqing Wanzhou Xianfeng Hydroelectricity Plant	254729		DSSD536	087100001	Chongqing City Wanzhou Measurement Quality Testing Center	2008-08-11	2013-08-10
78	Mayihe Hydroelectric Plant	Old meter	50113401324-2	DSF32	2009047 2010052 2011025	Sichuan Yingjing Power Limited Company Metrological Verification Station	2009-04-16 2010-03-23 2011-03-23	2010-04-15 2011-03-22 2012-03-22
		New meter	09110204330092	DSSD331	201011015	Ya'an Yingjing Power Supply Limited Company Metrological Verification Station	2010-08-28	2015-08-27
82	Yunwushan Hydroelectric Plant	Old meter	50123400293-2	DSF32	2009060	Sichuan Yingjing Power Limited Company Metrological Verification Station	2009-05-27	2010-05-26
		New meter	09110204330098	DSSD331	201010018	Ya'an Yingjing Power Supply Limited Company Metrological	2010-01-14	2015-01-13

						Verification Station		
85	Daihuanggou Hydroelectric Plant	Old meter	50113402392-2	DSF32	2009055 2010072 2011048	Sichuan Yingjing Power Limited Company Metrological Verification Station	2009-04-14 2010-03-15 2011-03-07	2010-04-13 2011-03-14 2012-03-06
		New meter	10010237920004	DSSD331	201111032	Ya'an Yingjing Power Supply Limited Company Metrological Verification Station	2011-04-28	2016-04-27
86	Gaoqiaohe Hydroelectric Plant	Old meter	50153500001-2	DSF32	2009052	Sichuan Yingjing Power Limited Company Metrological Verification Station	2009-05-27	2010-05-26
		New meter	09110204330008	DSSD331	201011001	Ya'an Yingjing Power Supply Limited Company Metrological Verification Station	2010-01-12	2015-01-13
90	Dabaishu Hydroelectric Plant	030641		DSSD281	200705019	Yunnan Power Grid Company Lincang Power Supply Bureau Power Energy Metrological Center	2007-05-09	2013-05-08
94	Zhenyuan County Xiaojiehe	04265653		DSSD188S (II8)	-	Zhenyuan Power Supply Limited	2009-05-22	-

	Hydropower Station				Company	2010-04-08 2010-10-21 2011-07-13	
95	Jinghong City Chuangye Hydropower Station	011107050224	DSSD3000	-	Jinghong Power Supply Limited Company	2009-05-13 2010-05-10 2011-05-06	-

Table 3-3.2

Project No.	Project title	Meter Serial No.	Meter Model Number	Calibration Entity	Calibration Date ⁷	Calibration Valid Until
37	Baijia Hydroelectric Plant	6012584356	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01
55	Canglong Hydroelectric Plant	200410419Q0313	DSSD331	Chongqing Fuling Electric Power Industrial Co., Ltd.	2009-07-01	2012-01-01

⁷ During the previous verification (1st monitoring period), the certification letters issued by the calibration entities confirm that the calibrations of the monitoring meters were valid until 2009-07-01. For this 2nd monitoring period, the calibrations of these meters are valid from 2009-07-01, so there is no gap between these two calibrations. Therefore, the calibration valid periods of these meters cover all this 2nd monitoring period.

57	Heixigou Hydroelectric Plant	6012584355	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01
59	Muzonghe Stage IV Hydroelectric Plant	6012584359	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01
62	Shuangchahe Hydroelectric Plant	10099436	ZFH405	Chongqing Fuling Electric Power Industrial Co., Ltd.	2009-07-01	2012-01-01
63	Songshigou Hydroelectric Plant	10099435	ZFH405	Chongqing Fuling Electric Power Industrial Co., Ltd.	2009-07-01	2012-01-01
65	Shujiahe Hydroelectric Plant	6012693630	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01
67	Baiguo Hydroelectric Plant	6012765144	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01
69	Baiyang Hydroelectric Plant	6012693715	DSSD71	Chongqing City Wulong County Power Supply Limited Company	2009-07-01	2012-01-01

Calibration of major electricity meters

A metrical institute authorized by the Administration of Standard Measurement will periodically carry out the verification of the electricity metering equipment according to relevant national electric industry standards and regulations. After the verification of every meter, the electricity metering equipment is sealed, stamped or by other means closed. Either party shall not unseal, change the structure, layout or any wire connection of the electricity equipment nor manipulate the equipment.

Training

Operational staffs are a crucial element for the GHG information quality control system. Training packages ensure that staffs receive adequate training to collect, and to achieve complete and accurate data necessary for VCU monitoring. All staff should follow this procedure on site prior to performing any monitoring duties for the Grouped Project:

1. Equip relevant staff with necessary mechanical, electric techniques.
2. Teach staff the structure of hydro power plant, and understand the common malfunctions and corresponding solutions
3. Design emergency plan and get staff familiar with the emergency plan
4. Organize professional training periodically to maintain and improve the professional skills of operating staff.
5. Additional learning session to comprehend the understanding of the requests of VCS on the monitoring system.
6. Set up monitoring knowledge exam for new staff to control the quality of training programm

Data Management System

This procedure provides details on how data are managed on a complete and accurate level. Data and records are stored and archived according to this procedure.

All monitoring data and records will be archived in electronic documents and paper documents. The project owners will also keep the copies of electricity generation record and sales receipts, The Central Information System Centre at South Pole provides integrated monitoring data services, hence an additional monitoring database is in place to prevent data loss as well as to ensure the consistency of all the data. Data have been input manually by project managers into the Project Management Tool System, which will be described in more detail in the following section. The project database is saved on South Pole's local China server which is synchronized daily with headquarter main server in Zurich to allow access of data between headquarter and regional offices.

PMT- Central Information Control Tool

Technical specifications

South Pole uses a custom-tailored project management software to monitor its project pipeline.

The Project Management Tool (PMT) is a web-based application running on South Pole's web server and is accessible from any computer with Internet access.

Connections between clients and the web server are secured with 128-bit SSL encryption. The backend is an apache web server, the web application is written in PHP5, and data is stored in a mySQL database. Utilizing mainstream open source technology, South Pole guarantees flexibility and reliability with regards to development and maintenance.

As South Pole has nine offices on four continents as of today, quality of the Internet connections varies significantly. To ensure optimal speed, the PMT utilizes techniques such as AJAX and asynchronous requests to load content on demand and provide short loading times even with several hundreds of projects displayed at the same time.

The PMT's server-client architecture guarantees that all data is kept consistent and always up to date for each user. The separation of presentation and data allows for flexible interfaces with other applications, easy data export and automated backups of sensitive and valuable project data.

Features

The PMT can be used to track individual projects under various standards, with different credit types and crediting periods, as well as groups of projects or entire pipelines of projects.

On the project level, tools such as milestone management, a sophisticated comment and notification system to facilitate communication between different team members, deadline alerts, etc. allow project managers and supervisors to meet targets and deadlines and monitor or project both past and future amount of emission reductions resulting out of a project.

One level above, various features allow grouping and manipulating several projects together, with combined overviews on milestone deadlines, generated emission reductions, and applied standards.

Data can be directly exported to Excel from within the PMT, both for individual projects as well as for groups of projects, to run custom evaluations or to visualize data.

Project identification

Our PMT system created 95 project tags. Each project has its identical project number, a brief project description, project owner's information, methodology and other information, vintage volume and milestones and related payment.

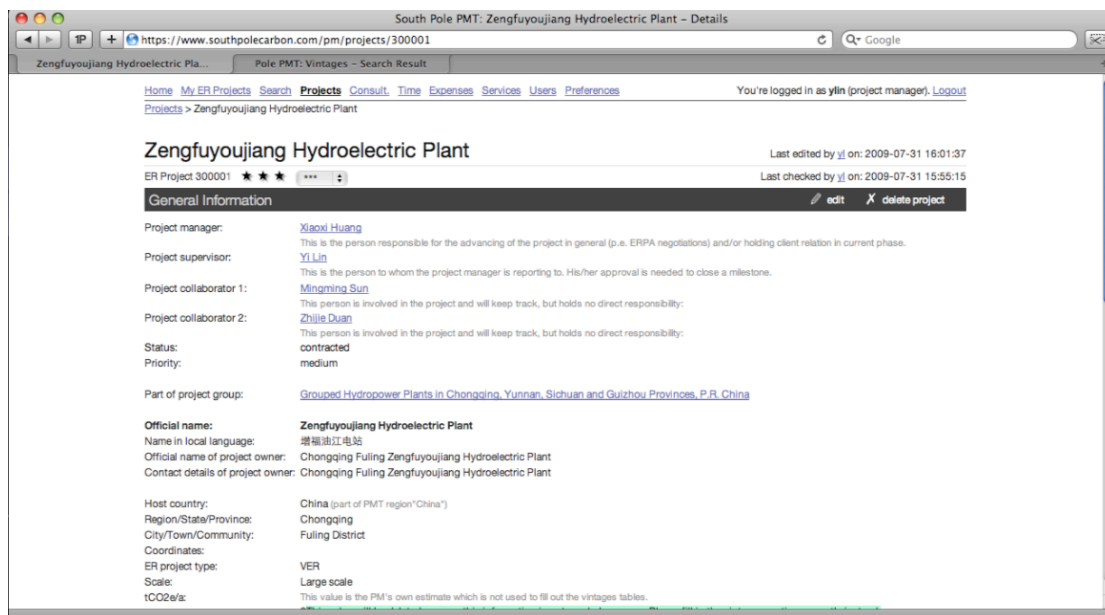


Figure-3-4

Quantity Assurance

Overview of vintages and emission reduction over crediting period

The Project Management Tool has a vintages review function. The PMT is able to store the existing emission reductions and estimate the foreseeable emission reductions. The vintage review function is linked to each project tag, which means any updates or/and changes by project managers regarding the project's emission reductions will be reflected in the vintages review section. Vintages review function allows the project manager and Implementation Control and Technical Teams to overview the entire Grouped Project and conduct spot checks. Aggregation for emission reductions of annual total, emission reductions of crediting period total etc. is applicable.

At the end of each crediting period, the emission reduction of the 95 projects will be spot checked with electronic copies of electrical sale invoices.

South Pole PMT: Vintages - Search Result

Home My ER Projects Search Projects Consult Time Expenses Services Users Preferences You're logged in as yilin (project manager). Logout

Bookmarked Vintage Packages - Search Result for Group [advanced search](#)

Emission Reduction Vintages - Group Grouped Hydropower Plants in Chongqing, Yunnan, Sichuan and Guizhou Provinces, P.R. China [switch to projects overview](#)

Vintages Overview - 20 Packages

The numbers show available credits (expected plus issued minus assigned or delivered). Dark turquoise vintages have not been quality checked.

scroll back scroll ahead

Package	Type	Project	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
300001 - A		Zengfuyoujiang Hydroelectric Plant	0	91	1090	1090	1090	1090	1090	1090	1090	1090
300002 - A		Jianshilan Hydroelectric Plant	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
300003 - A		Jinxing Hydroelectric Plant	2590	2590	2590	2590	2590	2590	2590	2590	2590	2590
300004 - A		Huzhong Hydroelectric Plant	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050
300005 - A		Chongqing Wanzhou Fenqun Hydroelectric	144	574	574	574	574	574	574	574	574	574
300006 - A		Chongqing Wanzhou Lengdong Hydroelectric	545	545	545	545	545	545	545	545	545	545
300007 - A		Chongqing Wanzhou Dangai Hydroelectric	1019	1528	1528	1528	1528	1528	1528	1528	1528	1528
300008 - A		Chongqing Wanzhou Maoyue Hydroelectric	0	0	535	584	584	584	584	584	584	584
300009 - A		Chongqing Wanzhou Xiaokang Hydroelectric	198	1188	1188	1188	1188	1188	1188	1188	1188	1188
300010 - A		Chongqing Wanzhou Yina Hydroelectric	0	97	1168	1168	1168	1168	1168	1168	1168	1168
300011 - A		Chongqing Wanzhou Tiande Hydroelectric	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142
300012 - A		Chongqing Wanzhou Puding Hydroelectric	0	574	1149	1149	1149	1149	1149	1149	1149	1149
300013 - A		Chongqing Wanzhou Yanhan Hydroelectric	383	1149	1149	1149	1149	1149	1149	1149	1149	1149
300014 - A		Chongqing Wanzhou Lianmen Hydroelectric	0	1778	1778	1778	1778	1778	1778	1778	1778	1778
300015 - A		Chongqing Wanzhou Wanlin Hydroelectric	0	501	2005	2005	2005	2005	2005	2005	2005	2005
300016 - A		Chongqing Wanzhou Gaodongzi Hydroelectric	0	0	2439	2439	2439	2439	2439	2439	2439	2439
300017 - A		Chongqing Wanzhou Luotian Hydroelectric	0	584	1752	1752	1752	1752	1752	1752	1752	1752
300018 - A		Chongqing Wanzhou Yanjinzi Hydroelectric	0	1142	1713	1713	1713	1713	1713	1713	1713	1713
300019 - A		Chongqing Wanzhou Baiyandong Hydroelectric	0	0	1229	2950	2950	2950	2950	2950	2950	2950

Figure-3-5

Time management-Milestone featuring

Once a project is established in the PMT, all the milestones of the project identifying the critical project path of the project cycle are automatically in place. For each milestone, PMT automatically inserts an estimate of the plausible milestones completion time, and indicated the due dates to the project manager. A milestones overview feature lets supervisors keep track of statistics of the estimated milestones completion time compared to the actual milestones implementing time, which will be preserved as part of project history for later project management evaluation. This feature is the key time management tool; it allows project managers and the supervisors to always be aware of the deadlines and trace the status and progress of the each project.

South Pole PMT: Zengfuyoujiang Hydroelectric Plant - Details

Home My ER Projects Search Projects Consult Time Expenses Services Users Preferences You're logged in as yilin (project manager). Logout

Projects > Zengfuyoujiang Hydroelectric Plant

Zengfuyoujiang Hydroelectric Plant

Last edited by sa on: 2009-08-03 12:28:09

ER Project 300001 ★ ★ ★ Last checked by yl on: 2009-07-31 15:55:15

General Information [edit](#) [delete project](#)

Milestones

The status of the milestone is depicted on the left by a line (=closed) or a dotted line (=requesting closure). Move the mouse over a date to see if it is the planned date or the achieved date.

Status / Milestone	Due date	edit	delete
Exclusivity and Terms	2008-08-20	edit	X
Initial Project Assessment	2008-10-20	edit	X
ERPA	2008-11-15	edit	X
Main Project Assessment	2009-04-20	edit	X
PDD	2009-05-13	edit	X
Validation	2009-10-09	edit	X
Verification	2009-10-09	edit	X
Registration	2009-12-31	edit	X
ER Issuance	2009-12-31	edit	X

Figure 3-6

Quality Assurance- quality check and commenting

Projects have to pass each single step consisting of Initial Project Assessment, Main Project Assessment, ERPA, validation, monitoring and verification milestones of the project cycle.

A project manager can request for closing of a project milestone if tasks of such milestone have been accomplished subjected to South Pole's company internal guidance. A quality stamp by the Implementation Control and Technical Team must be given to close milestone completely and to leave way to process the next milestones.

The comment function is designed to identify problems and to collect ways of possible solutions within the project management team. When one comment is inserted into the PMT entry of a specific project, subsequently the notification will appear on the PMT home screen of the corresponding project manager. If project manager has new findings regarding the project, the comment system is able to feedback updates on the project to the quality control team. The project manager can also trace which person raised the question and follow up a further discussion if necessary.

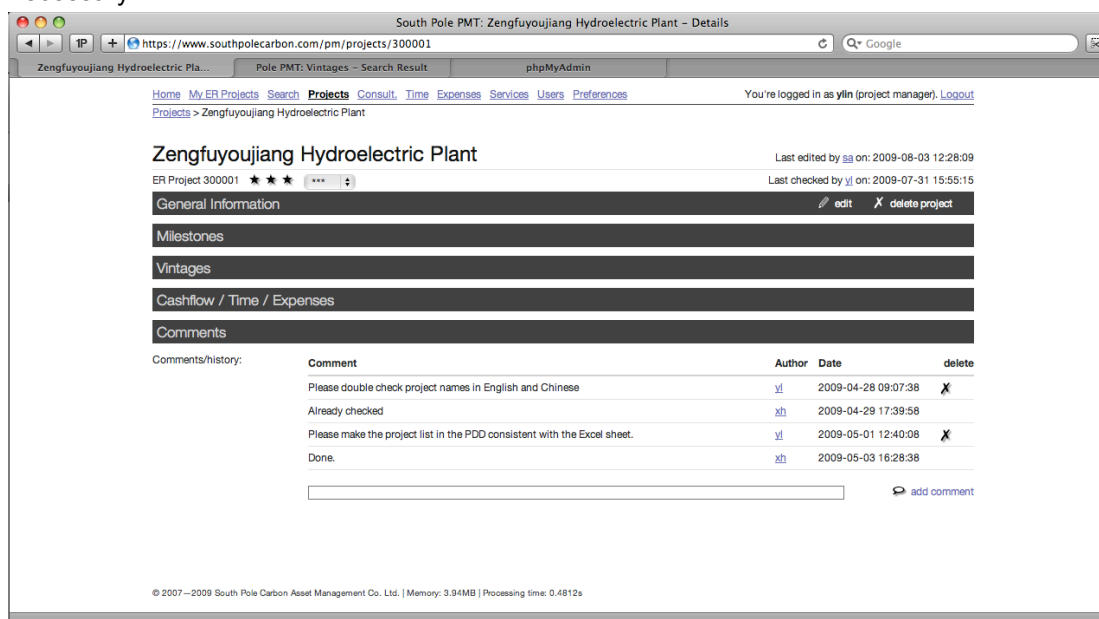


Figure 3-7

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

According to methodology AMS-I.D (Version 13), the baseline emissions of the project are the product of the baseline emissions factor (EF_y in tCO_2/MWh), calculated according to the "Tool to calculate the emission factor for an electricity system" (Version 1.1), times the electricity exported to the grid by the project activity (EG_y in MWh):

$$BE_y = EG_y \times EF_y$$

Grid Emission Factor was calculated in PD to be 0.97350 t CO₂e/MWh for Central China Power Grid and 0.87118 tCO₂e/MWh for Southern China Power Grid. These grid emission factors are determined ex-ante and fixed during the crediting period.

During this monitoring period, the baseline emission reductions for Central China Power Grid is:

$$BE = EG \times EF = 816735.541 \times 0.97350 = 794955 \text{ tCO}_2\text{e/year}$$

During this monitoring period, the baseline emission reductions for South China Power Grid is:

$$BE = EG \times EF = 327126.366 \times 0.87118 = 284968 \text{ tCO}_2\text{e/year}$$

The total baseline emissions for the Grouped Project during this monitoring period amounts therefore to 1,079,923 tCO₂e/year.

4.2 Project Emissions

The project activity is a run-of-river hydropower project and, as per AMS-I.D, the GHGs emitted from such project activities are considered to be zero.

Project Emissions = 0

4.3 Leakage

According to AMS-I.D Version 13, there were neither energy generating equipment transferred from another activity nor existing equipment transferred to another activity, so no leakage calculation is required for the proposed project activity.

Leakage = 0

4.4 Summary of GHG Emission Reductions and Removals

The calculated emission reductions achieved by the project activity within the covered monitoring period amount to 1,079,923 tCO₂e in total, of which 794,955 tCO₂e occurred in the Central China Power Grid and 284,968 tCO₂e in the Southern China Power Grid. A summary of monitoring data and emission reductions based on aggregated data on a yearly basis are provided in the table below⁸.

1	Zengfuyoujiang Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0

⁸ Data are not available during this monitoring period for some individual hydropower plants (project numbers included: 1, 2, 16, 29, 32, 45, 53, 61, 70, 71, 72, 73, 74, 75, 79, 93, 97). Therefore, these projects have claimed zero emission reductions during this monitoring period.

2010	0	0
2011	0	0
Total	0	0
2	Jianshitian Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
3	Jinxing Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-19	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-19	1222845	1190
2009-12-20 to 2010-12-19	3065720	2983
2010-12-20 to 2011-06-19	1005045	978
Total	5293610	5151
4	Huzhong Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-19	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-19	3231165	3145
2009-12-20 to 2010-12-19	10188010	9917
2010-12-20 to 2011-06-19	3492755	3399
Total	16911930	16461
5&6	Chongqing Wanzhou Fengmu & Longdong Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	417820	406
2009-12-26 to 2010-12-25	898342	874
2010-12-26 to 2011-06-25	342018	332
Total	1658180	1612
7	Chongqing Wanzhou Dengta Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)

2009-06-26 to 2009-12-25	324156	315
2009-12-26 to 2010-12-25	671178	652
2010-12-26 to 2011-06-25	232959	226
Total	1228293	1193
8	Chongqing Wanzhou Mayuexi Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	205875	200
2009-12-26 to 2010-11-25	424947	413
2010-11-26 to 2011-06-25	162582	158
Total	793404	771
9	Chongqing Wanzhou Xiaolong Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	558678	543
2009-12-26 to 2010-12-25	1161834	1131
2010-12-26 to 2011-06-25	488902	475
Total	2209415	2149
10	Chongqing Wanzhou Yihe Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-11-25	552240	537
2009-11-26 to 2010-12-25	673746	655
2010-12-26 to 2011-06-25	169920	165
Total	1395906	1357
11	Chongqing Wanzhou Tiande Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	525656	511
2009-12-26 to 2010-12-25	915846	891
2010-12-26 to 2011-06-25	370716	360
Total	1812218	1762

12	Chongqing Wanzhou Puziling Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-11-25	294156	286
2009-11-26 to 2010-12-25	852781	829
2010-12-26 to 2011-06-25	352324	342
Total	1499261	1457
13	Chongqing Wanzhou Yanshan Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	794208	772
2009-12-26 to 2010-11-25	1205128	1173
2010-11-26 to 2011-06-25	459392	447
Total	2458728	2392
14	Chongqing Wanzhou Lianmeng Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-11-25	517060	503
2009-11-26 to 2010-12-25	733374	713
2010-12-26 to 2011-06-25	352482	343
Total	1602917	1559
15	Chongqing Wanzhou Wanlin Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-25	925430	900
2009-12-26 to 2010-12-25	1495460	1455
2010-12-26 to 2011-06-25	299176	291
Total	2720066	2646
16	Chongqing Wanzhou Gaodongzi Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	

Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
18 Chongqing Wanzhou Yanjingxi Hydroelectric Plant		
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-11-25	529498	515
2009-11-26 to 2010-12-25	1363094	1326
2010-12-26 to 2011-06-25	576667	561
Total	2469259	2402
20 Chongqing Wanzhou Dibao Hydroelectric Plant		
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1788166	1740
2009-12-26 to 2010-12-25	3527178	3433
2010-12-26 to 2011-06-25	1306778	1271
Total	6622122	6444
21 Chongqing Wanzhou Xianfeng Hydroelectric Plant		
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	3638445	3541
2009-12-26 to 2010-12-25	7540221	7339
2010-12-26 to 2011-06-25	3081857	2999
Total	14260523	13879
22&31 Heba & Chengmending Hydroelectric Plant		
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	647614	630
2009-12-26 to 2010-12-25	2315349	2253
2010-12-26 to 2011-06-25	828489	806
Total	3791452	3689

23	Sandaoguai Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	156597	152
2009-12-26 to 2010-12-25	262703	255
2010-12-26 to 2011-06-25	90601	88
Total	509900	495
24	Beiya Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	138129	134
2009-12-26 to 2010-12-25	461391	448
2010-12-26 to 2011-06-25	145654	141
Total	745174	723
25	Wulong Guanqiao Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	117182	113
2009-12-26 to 2010-12-25	371622	361
2010-12-26 to 2011-06-25	206544	200
Total	695348	674
26&40&48	Xiangyang Stage II & III & I Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1231880	1199
2009-12-26 to 2010-12-25	4782079	4654
2010-12-26 to 2011-06-25	1362860	1326
Total	7376819	7179
27	Qingtongxi Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)

2009-06-26 to 2009-12-25	195355	189
2009-12-26 to 2010-12-25	641209	623
2010-12-26 to 2011-06-25	321122	312
Total	1157685	1124
28	Heping Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	280278	272
2009-12-26 to 2010-12-25	904269	879
2010-12-26 to 2011-06-25	224114	217
Total	1408662	1368
29	Guanziya Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
30	Baiyangping Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	163680	159
2009-12-16 to 2010-12-15	581080	565
2010-12-16 to 2011-06-15	169216	164
Total	913976	888
32	Shuanglong Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
33	Chushuitang Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	

Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	913668	889
2009-12-26 to 2010-12-25	1338162	1302
2010-12-26 to 2011-06-25	801516	780
Total	3053346	2971
34	Shuangqiao Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	97650	94
2009-12-26 to 2010-12-25	663530	645
2010-12-26 to 2011-06-25	283650	275
Total	1044830	1014
35	Shiqiao Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	365187	355
2009-12-26 to 2010-12-25	1002837	975
2010-12-26 to 2011-06-25	265717	258
Total	1633742	1588
36	Shuanglian Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	124938	121
2009-12-26 to 2010-12-25	247422	240
2010-12-26 to 2011-06-25	175422	170
Total	547782	531
37	Baijia Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	217194	211
2009-12-26 to 2010-12-25	327936	319
2010-12-26 to 2011-06-25	129840	126
Total	674970	656

38	Xinqiao Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	210042	204
2009-12-26 to 2010-12-25	318738	310
2010-12-26 to 2011-06-25	234708	228
Total	763488	742
39	Luchi Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2010-12-21 to 2011-06-20	156863	152
Total	156863	152
41	Xiangyun Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	303078	294
2009-12-26 to 2010-12-25	1171032	1139
2010-12-26 to 2011-06-25	434712	423
Total	1908822	1856
42	Hongshan Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	230592	224
2009-12-26 to 2010-12-25	922123	897
2010-12-26 to 2011-06-25	282432	274
Total	1435147	1395
43	Leyuan Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1052029	1023

2009-12-26 to 2010-12-25	2669576	2598
2010-12-26 to 2011-06-25	983509	957
Total	4705113	4578
44	Yong'an Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	432405	420
2009-12-26 to 2010-12-25	1696803	1651
2010-12-26 to 2011-06-25	544004	529
Total	2673212	2600
45	Suokousi Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
46	Xinli Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	467814	455
2009-12-26 to 2010-12-25	1000622	974
2010-12-26 to 2011-06-25	446270	434
Total	1914706	1863
47	Caijiagou Stage III Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	891180	867
2009-12-16 to 2010-12-15	2661980	2591
2010-12-16 to 2011-06-15	727660	708
Total	4280820	4166
49	Cheqingyan Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	

EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1081848	1052
2009-12-26 to 2010-12-25	2875254	2798
2010-12-26 to 2011-06-25	1135848	1105
Total	5092950	4955
50	Lianghekou Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-14	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010-08-14 to 2010-10-14	244783	238
2011-01-14 to 2011-06-14	384424	374
Total	629207	612
51	Wuhe Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	341500	332
2009-12-26 to 2010-12-25	832400	809
2010-12-26 to 2011-06-25	414300	403
Total	1588200	1544
52	Sihe Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	944790	919
2009-12-26 to 2010-12-25	2381990	2318
2010-12-26 to 2011-06-25	1073580	1044
Total	4400360	4281
53	Shilingyan Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0

54	Nanmu Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	596679	580
2009-12-26 to 2010-12-25	2667480	2596
2010-12-26 to 2011-06-25	1499184	1459
Total	4763342	4635
55	Canglong Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	1318620	1283
2009-12-16 to 2010-12-15	3599985	3503
2010-12-16 to 2011-06-15	1069590	1041
Total	5988195	5827
56	Daheba Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1500600	1460
2009-12-26 to 2010-12-25	4311795	4197
2010-12-26 to 2011-06-25	1474110	1434
Total	7286505	7091
57	Heixigou Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	2437542	2372
2009-12-26 to 2010-12-25	4735800	4609
2010-12-26 to 2011-06-25	1860840	1811
Total	9034182	8792
58	Yanchanghe Stage III Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1559264	1517

2009-12-26 to 2010-12-25	3421152	3329
2010-12-26 to 2011-06-25	1601408	1558
Total	6581824	6404
59	Muzonghe Stage IV Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	2540025	2472
2009-12-26 to 2010-12-25	5022120	4888
2010-12-26 to 2011-06-25	2529180	2462
Total	10091325	9822
60	Dengta Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	783120	762
2009-12-16 to 2010-12-15	2131880	2074
2010-12-16 to 2011-06-15	631920	614
Total	3546920	3450
61	Banqiao Stage II Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
62	Shuangchahe Hydroelectric Plant	
Monitoring Period	2009-06-15 to 2011-06-14	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-15 to 2009-12-14	1826523	1777
2009-12-15 to 2010-12-14	5517002	5370
2010-12-15 to 2011-06-14	1849442	1800
Total	9192967	8947
63	Songshigou Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	

EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	723960	704
2009-12-16 to 2010-12-15	1627540	1583
2010-12-16 to 2011-06-15	950700	925
Total	3302200	3212
64	Banqiao Stage III Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	2663052	2592
2009-12-26 to 2010-12-25	8627633	8398
2010-12-26 to 2011-06-25	3147603	3063
Total	14438288	14053
65	Shujiahe Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	1258520	1225
2009-12-26 to 2010-12-25	4186120	4074
2010-12-26 to 2011-06-25	1380960	1344
Total	6825600	6643
66	Yangyan Hydroelectric Plant	
Monitoring Period	2009-06-14 to 2011-06-13	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-14 to 2009-12-13	2798530	2724
2009-12-14 to 2010-12-13	4745665	4619
2010-12-14 to 2011-06-13	530016	515
Total	8074211	7858
67	Baiguo Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	3586835	3491
2009-12-26 to 2010-12-25	7733616	7528
2010-12-26 to 2011-06-25	3695915	3597
Total	15016366	14616

68	Longqiao Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	5698448	5547
2009-12-16 to 2010-12-15	14420060	14037
2010-12-16 to 2011-06-15	3246906	3160
Total	23365414	22744
69	Baiyang Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	4362960	4247
2009-12-26 to 2010-12-25	13036065	12690
2010-12-26 to 2011-06-25	5189625	5051
Total	22588650	21988
70	Xinmin Tailwater Stage II Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
71	Dongliuhe Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
72	Dahegou Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0

2010	0	0
2011	0	0
Total	0	0
73	Xinmin Stage II Hydroelectric Plant	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
74	Guizhou Province Xingyi City Puti Hydropower Plant Technical Reform Project	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
75	Guizhou Province Xingyi City Puti 2nd Stage (Xiniutang) Hydropower Plant Technical Reform Project	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
76	Wumaxi Stage I Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	2029151	1975
2009-12-21 to 2010-12-20	3255672	3169
2010-12-21 to 2011-06-20	1288955	1254
Total	6573777	6398

77 Mozigou Hydroelectric Plant		
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	2310274	2249
2009-12-21 to 2010-12-20	3106233	3023
2010-12-21 to 2011-06-20	1076469	1047
Total	6492976	6319
78 Mayihe Hydroelectric Plant		
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	4078777	3970
2009-12-21 to 2010-12-20	7103126	6914
2010-12-21 to 2011-06-20	2804040	2729
Total	13985944	13613
79 Jinyatan Hydroelectric Plant		
Monitoring Period	N/A	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
80 Toudaoshui Hydroelectric Station		
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	3233616	3147
2009-12-21 to 2010-12-20	12831442	12491
2010-12-21 to 2011-06-20	3915623	3811
Total	19980681	19449
81 Sanhui Hydroelectric Plant		
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	12102490	11781

2009-12-21 to 2010-12-20	16814027	16368
2010-12-21 to 2011-06-20	5151545	5015
Total	34068062	33164
82	Yunwushan Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	13410582	13055
2009-12-21 to 2010-12-20	19086302	18580
2010-12-21 to 2011-06-20	9193492	8949
Total	41690376	40584
83	Gongjiagou Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	22998726	22389
2009-12-21 to 2010-12-20	45306751	44106
2010-12-21 to 2011-06-20	17525430	17061
Total	85830908	83556
84	Chahe Stage III Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	16206867	15777
2009-12-21 to 2010-12-20	27460603	26732
2010-12-21 to 2011-06-20	10527029	10248
Total	54194500	52757
85	Daihuanggou Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	19284065	18773
2009-12-21 to 2010-12-20	27217500	26496
2010-12-21 to 2011-06-20	11871654	11557
Total	58373220	56826
86	Gaoqiaohe Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	

EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	33105748	32228
2009-12-21 to 2010-12-20	55411733	53943
2010-12-21 to 2011-06-20	22101049	21515
Total	110618530	107686
87	Zhuyeshan Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	0	0
2009-12-21 to 2010-12-20	11663068	11353
2010-12-21 to 2011-06-20	6147936	5985
Total	17811004	17338
88	Lianghekou Hydroelectric Plant	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	CCPG	
EF (tCO ₂ e/MWh)	0.9735	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	29167124	28394
2009-12-26 to 2010-12-25	50845286	49497
2010-12-26 to 2011-06-25	20968757	20413
Total	100981168	98304
90	Dabaishu Hydroelectric Plant	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	10358378	9023
2009-12-21 to 2010-12-20	15664330	13645
2010-12-21 to 2011-06-20	7437080	6478
Total	33459788	29146
91	Dashi Stage III Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	8024842	6990
2009-12-16 to 2010-12-15	11649291	10147
2010-12-16 to 2011-06-15	5063210	4410
Total	24737343	21547

92	Dashi Stage II Hydroelectric Plant	
Monitoring Period	2009-06-16 to 2011-06-15	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-16 to 2009-12-15	10051599	8756
2009-12-16 to 2010-12-15	14353444	12503
2010-12-16 to 2011-06-15	6568273	5721
Total	30973316	26980
93	Yunnan Midu County Taishanhe Hydropower Station	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
94	Zhenyuan County Xiaojiehe Hydropower Station	
Monitoring Period	2009-06-26 to 2011-06-25	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-25	10655994	9283
2009-12-26 to 2010-12-25	13556008	11809
2010-12-26 to 2011-06-25	2087398	1818
Total	26299400	22910
95	Jinghong City Chuangye Hydropower Station	
Monitoring Period	2009-06-21 to 2011-06-20	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-21 to 2009-12-20	24169737	21056
2009-12-21 to 2010-12-20	26260439	22877
2010-12-21 to 2011-06-20	8986468	7828
Total	59416644	51761
96	Yingjiang Husa River 5th Stage Hydropower Plant	
Monitoring Period	2009-06-26 to 2011-06-10	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)

2009-06-26 to 2009-12-25	26635598	23204
2009-12-26 to 2010-12-10	31379122	27336
2010-12-11 to 2011-06-10	9323905	8122
Total	67338624	58662
97	Yunnan Province Jinping County Mengqiao Village Datan Hydropower Station	
Monitoring Period	N/A	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009	0	0
2010	0	0
2011	0	0
Total	0	0
98	Fugong County Lishadi Hydropower Plant Project	
Monitoring Period	2009-06-26 to 2011-06-20	
Power Grid	SCPG	
EF (tCO ₂ e/MWh)	0.87118	
Year	Net Electricity supplied to grid (MWh)	Emission Reductions (tCO ₂ e)
2009-06-26 to 2009-12-15	20909051	18215
2009-12-16 to 2010-12-20	45595500	39721
2010-12-21 to 2011-06-20	18396701	16026
Total	84901251	73962

Summary of net export electricity per year:

	CCPG EG (MWh)	SCPG EG (MWh)	Combined of both grids EG (MWh)
2009	217712.126	110805.199	328517.324
2010	431277.405	158458.132	589735.537
2011	167746.010	57863.035	225609.045
Total	816735.541	327126.366	1143861.907

Summary of emission reductions per year:

	CCPG ER (tCO ₂ e)	SCPG ER (tCO ₂ e)	Combined of both grids ER (tCO ₂ e)
2009	211903	96527	308430
2010	419793	138038	557831
2011	163259	50403	213662
Total	794955	284968	1079923

5 ADDITIONAL INFORMATION

5.1 Detailed Information of the Monitoring Equipment

Table 5-1 Serial number and model number of monitoring meters for the sampling projects

Project No.	Project title	Meter Serial No.	Meter Model Number
21	Chongqing Wanzhou Xianfeng Hydroelectricity Plant	254729	DSSD536
37	Baijia Hydroelectric Plant	6012584356	DSSD71
55	Canglong Hydroelectric Plant	200410419Q0313	DSSD331
57	Heixigou Hydroelectric Plant	6012584355	DSSD71
59	Muzonghe Stage IV Hydroelectric Plant	6012584359	DSSD71
62	Shuangchahe Hydroelectric Plant	10099436	ZFH405
63	Songshigou Hydroelectric Plant	10099435	ZFH405
65	Shujiahe Hydroelectric Plant	6012693630	DSSD71
67	Baiguo Hydroelectric Plant	6012765144	DSSD71
69	Baiyang Hydroelectric Plant	6012693715	DSSD71
78	Mayihe Hydroelectric Plant	09110204330092	DSSD331
82	Yunwushan Hydroelectric Plant	09110204330098	DSSD331
85	Daihuanggou Hydroelectric Plant	10010237920004	DSSD331
86	Gaoqiaohe Hydroelectric Plant	09110204330008	DSSD331
90	Dabaishu Hydroelectric Plant	030641	DSSD281
94	Zhenyuan County Xiaojiehe Hydropower Station	04265653	DSSD188S (II8)
95	Jinghong City Chuangye Hydropower Station	011107050224	DSSD3000

Table 5-2 Detailed information of monitoring meters replacement for the sampling projects

Project No.	Project short title	Invoice meter change date	Invoice meter model number		Invoice meter serial no.		Invoice meter accuracy	
			old	new	old	new	old	new
21	Xianfeng ⁹	-	DSSD290-S	DSSD536	021960	254729	1	0.5S
37	Baijia	10 Oct 2010	DSSD331	DSSD71	200404352Q0049	6012584356	0.5	0.5S
57	Heixigou	15 Dec 2009	DSSD331	DSSD71	200404352Q0057	6012584355	0.5S	0.5S
59	Muzonghe IV	15 Dec 2009	DSSD71	DSSD71	6012099414	6012584359	0.5S	0.5S
62	Shuangchahe	27 Oct 2010	DSSD331	ZFH405	20070225020122	10099436	0.2	0.5S
63	Songshigou	8 Sep 2010	DSF32	ZFH405	50113200126-2	10099435	1	0.5S
65	Shujiuhe	24 Sep 2010	DSSD331	DSSD71	200404352Q0064	6012693630	0.2	0.5S
67	Baiguo	24 Oct 2010	DSSD581 XF	DSSD71	2001-498164	6012765144	0.5	0.5S
69	Baiyang	24 Oct 2010	DSSD581 XFT	DSSD71	292444	6012693715	0.5	0.5S
78	Mayihe	19 May 2011	DSF32	DSSD331	50113401324-2	09110204330092	1	1
82	Yunwushan	14 Jan 2010	DSF32	DSSD331	50123400293-2	09110204330098	2	1
85	Daihuanggou	28 Apr 2011	DSF32	DSSD331	50113402392-2	10010237920004	1	1
86	Gaoqiaohe	3 Feb 2010	DSF32	DSSD331	50153500001-2	09110204330008	0.5	1

⁹ The monitoring meter of 21_Xianfeng project has never been changed during the first and second monitoring periods (from 01-04-2006 to 25-06-2011). However, due to incorrect monitoring meter information from another meter photo was used, incorrect meter information was written in the previous monitoring report for the first monitoring period. Here, the correct meter information has been presented (DSSD536, 254729, 0.5S). Illustration letters issued by the local grid company and the project owner respectively have been provided for clarification.

Table 5-3 Detailed information of monitoring meters for each individual project

Project No.	Project Title	Accuracy of the gateway meter	Position of the gateway meter	Substation
1	Zengfuyoujiang Hydroelectric Plant	1	On the main transformer in the hydropower plant	10kV-Xinmiao 35kv substation-Chongqing grid-grid,400V-10KV
2	Jianshitan Hydroelectric Plant	1	On the main transformer in the hydropower plant	10kV-Nanchuan Chengjiao 35kv substation-Chongqing grid-grid,400V-10KV
3	Jinxing Hydroelectric Plant	0.2	Substation	10kV-Runxi 35kv substation-Pengshui grid-grid,400V-10KV
4	Huzhong Hydroelectric Plant	0.2	Substation	10kV-Shangtang 35kv substation-Pengshui grid-grid,6.3KV-35KV
5	Chongqing Wanzhou Fengmu Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Baitu 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
6	Chongqing Wanzhou Longdong Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Baitu 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
7	Chongqing Wanzhou Dengta Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Xinxiang 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
8	Chongqing Wanzhou Mayuexi Hydroelectric Plant	0.5s	The third electricity pole outside the plant	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Ganning 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
9	Chongqing Wanzhou Xiaolong Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Baitu 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
10	Chongqing Wanzhou Yihe Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	The electricity round voltage is 0.4kv,the voltage step-up into 10kv and then transmitted to Xiaopei 35kv

				substation, finally the electricity fed into CCPG via Chongqing power grid.
11	Chongqing Wanzhou Tiande Hydroelectric Plant	1.0	On the main transformer in the hydropower plant	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and then transmitted to Xiaopei 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
12	Chongqing Wanzhou Puziling Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and then transmitted to Longju 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
13	Chongqing Wanzhou Yanshan Hydroelectric Plant	0.5	On the transformer in substation	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and then transmitted to Longju 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
14	Chongqing Wanzhou Lianmeng Hydroelectric Plant	0.5s	Lianmeng Bridge	The electricity round voltage is 0.4kv, the voltage is stepped-up into 10kV and then transmitted to Sanyuan 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
15	Chongqing Wanzhou Wanlin Hydroelectric Plant	1.0	On the transformer in substation	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and transmitted to Baitu 35kv substation then to the 35kv Fenshui substation, and finally the electricity fed into CCPG.
16	Chongqing Wanzhou Gaodongzi Hydroelectric Plant	1.0	On the main transformer in the hydropower plant	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and then transmitted to Wuqiao 110kv substation, finally the electricity fed into CCPG via Chongqing power grid.
18	Chongqing Wanzhou Yanjingxi Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and then transmitted to Baitu 35kv substation, finally the electricity fed into CCPG via Chongqing power grid.
20	Chongqing Wanzhou Dibao Hydroelectric Plant	0.5s	On the transformer in substation	The electricity round voltage is 0.4kv, the voltage step-up into 10kV and transmitted to Baitu 35kv

				substation then to the 35kv Fenshui substation, and finally the electricity fed into CCPG.
21	Chongqing Wanzhou Xianfeng Hydroelectric Plant	0.5S	On the transformer in substation	6.3KV-main substation-35KV-Longju power station-local grid-grid
22	Heba Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Yangjiao substation-Wulong grid-grid,400V-10KV
23	Sandaoguai Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Yajiangdaqiao substation-Wulong grid-grid,380V-10KV
24	Beiya Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Yangjiao 35kv substation-Wulong grid-grid,400V-10KV
25	Wulong Guanqiao Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Xiannvshan substation-Wulong grid-grid,400V-10KV
26	Xiangyang Stage II Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Huolu 35kv substation-Wulong grid-grid,400V-10KV
27	Qingtongxi Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Baima 35kv substation-Wulong grid-grid,400V-10KV
28	Heping Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Yangjiao substation-Wulong grid-grid,400V-10KV
29	Guanziya Hydroelectric Plant	0.5	Booster station of Baiguo power station	10kV-Baiguo power station-Chengguan substation-Wulong grid-grid,400V-10KV
30	Baiyangping Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Zhongbaowan substation-Fuling grid-grid,400V-10KV
31	Chengmending Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Yangjiao substation-Wulong grid-grid,400V-10KV
32	Shuanglong Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Zhongbaowan substation-Fuling grid-grid,380V-10KV
33	Chushuitang Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Tongzi substation-Wulong grid-grid,400V-10KV
34	Shuangqiao Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Tongzi substation-Wulong grid-grid,400V-10KV
35	Shiqiao Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Jiangkou substation-Wulong grid-grid,400V-10KV
36	Shuanglian Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Tongzi substation-Wulong grid-grid,400V-10KV
37	Baijia Hydroelectric Plant	0.5S	Substation	10kV-MUzonghe stage 3 substation-Wulong grid-grid,400V-10KV
38	Xinqiao Hydroelectric	0.5	Substation	10kV-Tongzi substation-Wulong

	Plant			grid-grid,400V-10KV
39	Luchi Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Zhongbaowan substation-Fuling grid-grid,400V-10KV)
40	Xiangyang Stage III Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Huolu 35kv substation-Wulong grid-grid,400V-10KV
41	Xiangyun Hydroelectric Plant	0.5	Telegraph pole outside of the Booster station	10kV-Yangjiao 35kv substation-Wulong grid-grid,400V-10KV
42	Hongshan Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Tongzi 35kv substation-Wulong grid-grid,400V-10KV
43	Leyuan Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Baima substation-35kv-grid,400V-10KV
44	Yong'an Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Yangjiao 35kv substation-Wulong grid-grid,400V-10KV
45	Suokousi Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Tukan substation-Fuling grid-grid,400V-10KV
46	Xinli Hydroelectric Plant	0.2	Muzonghe Stage 4 hydropower plant main transformer	10kV-Muzonghe 110kv substation-Wulong grid-grid,400V-10KV
47	Caijiagou Stage III Hydroelectric Plant	0.5	Zhongli Power station Booster station	10kV-Zhongli substation-Fuling grid-grid,400V-10KV
48	Xiangyang Stage I Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10KV-Huolu35KV substation-Wulong grid –grid, 400V-10KV
49	Cheqingyan Hydroelectric Plant	0.2	Dongshan Heng 14# telegraph pole	10kV-Changba substation-Wulong grid-grid,400V-10KV
50	Lianghekou Hydroelectric Plant	0.2	Substation	10kV-Zhongbaowan substation-Fuling grid-grid, 400V-10KV
51	Wuhe Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Jiguang substation-Wulong grid-grid, 400V-10KV
52	Sihe Hydroelectric Plant	0.2	Switch station of Yancanghe stage 1 power station	10KV-switch station of Yancanghe stage 1-Tongzi 35KV substation-Wuling grid-grid,400V-10KV
53	Shilingyan Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10KV-Pingqiao substation-Fuling grid-grid, 400V-10KV.
54	Nanmu Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Tongzi substation-Wulong grid-grid,400V-10KV
55	Canglong Hydroelectric Plant	1	On the main transformer in the hydropower plant	10kV- 35kV Huangyingxiang substation
56	Daheba Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10kV-Chenghuang 35kv substation-Wulong grid-grid , 400V-10KV
57	Heixigou Hydroelectric Plant	0.5s	On the main transformer in the	6.3KV-Muzonghe stage 3-110KV-grid

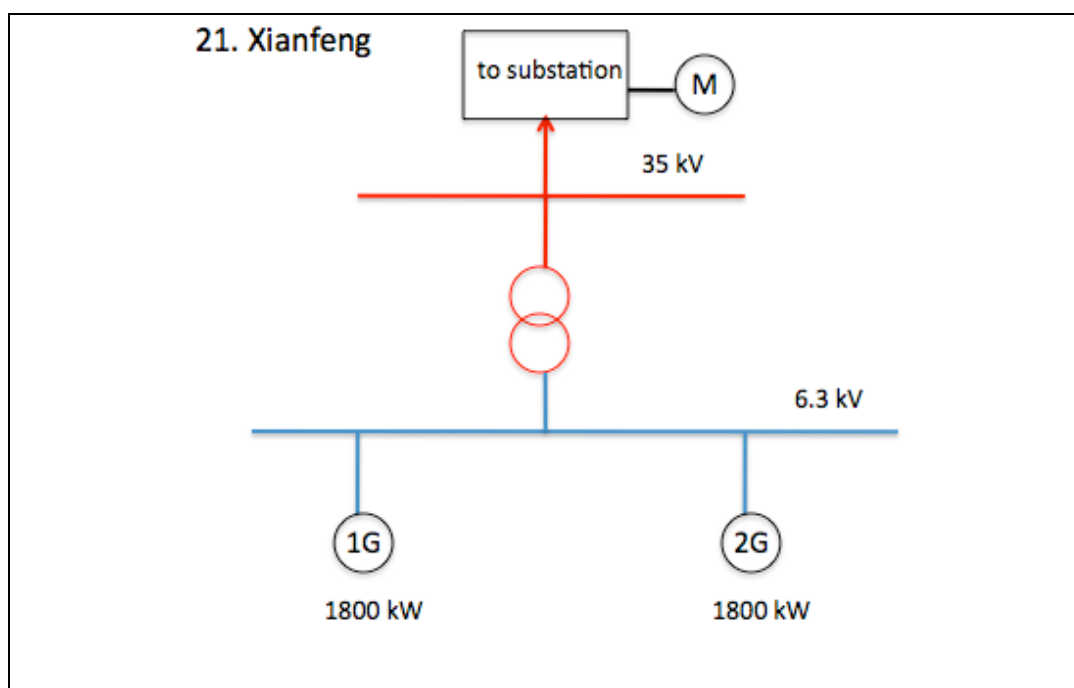
			hydropower plant	
58	Yanchanghe Stage III Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10kV-Tongzi substation-Wulong grid-grid 400V-10KV
59	Muzonghe Stage IV Hydroelectric Plant	0.5s	On the main transformer in the hydropower plant	400v-10KV
60	Dengta Hydroelectric Plant	0.2	Substation	10KV-Zhongli power station-Tukan substation –Fuling grid-grid ,400V-10KV
61	Banqiao Stage II Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	10KV-Chenghuang substation 35KV-Wulong grid-grid, 400V-10KV
62	Shuangchahe Hydroelectric Plant	0.5S	Substation	10kV-Zhongbaowan substation-Fuling grid-grid 400V-10KV
63	Songshigou Hydroelectric Plant	0.5S	On the main transformer in the hydropower plant	0.4KV-booster station-10KV-Tukan power station-Chuandong grid -grid
64	Banqiao Stage III Hydroelectric Plant	2	On the main transformer in the hydropower plant	0.4KV-booster station-10KV-35KV substation-grid
65	Shujiuhe Hydroelectric Plant	0.5S	Substation	10kV-Chengguan substation-Wulong grid -grid 6.3KV-10KV
66	Yangyan Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	6.3KV-Yajingdaqiao substation-Fuling grid-grid, voltage change from 6.3KV to 35KV
67	Baiguo Hydroelectric Plant	0.5S	On the main transformer in the hydropower plant	0.4KV-booster station of the power station and T connect to Wulong grid -grid
68	Longqiao Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	0.4KV-booster station-10KV-T connect to Xinmin stage 2 power station-grid
69	Baiyang Hydroelectric Plant	0.5S	On the main transformer in the hydropower plant	0.4KV-booster station- Chengguan substation- grid
70	Xinmin Tailwater Stage II Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10KV-Luolong substation-Fuling grid-grid and voltage chage from 400V to 10KV
71	Dongliuhe Hydroelectric Plant	0.2	On the main transformer in the hydropower plant	10KV-Huangying substation-Wulong grid-grid voltage change from 400V to10KV
72	Dahegou Hydroelectric Plant	0.5	On the main transformer in the hydropower plant	Stage1, 10kv-Stage 2-Nanchuan grid Stage2, 10kV-Nanchuan grid-Chongqing grid
73	Xinmin Stage II Hydroelectric Plant	0.2	Substation	35KV-Tukan substation-Fuling grid-grid, voltage change from 6.3KV into 35KV when pass Booster station
74	Guizhou Province Xingyi City Puti Hydropower Plant Technical Reform Project	0.5s	On the transformer in substation	35KV-Wusha substation-city grid-southern grid, voltage is lowered down when pass Booster station
75	Guizhou Province Xingyi City Puti 2nd	0.2s	On the transformer in substation	35KV-Wusha substation-city grid-southern grid, voltage is lowered down

	Stage (Xiniutang) Hydropower Plant Technical Reform Project			when pass Booster station
76	Wumaxi Stage I Hydroelectric Plant	2	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Sanhe substation through 10kv line finally to the grid, and the voltage changes from 10KV into 35KV when pass through the substation.
77	Mozigou Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Sanhe substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
78	Mayihe Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Xinmiao substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
79	Jinyatan Hydroelectric Plant	2	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Xingfu substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
80	Toudaoshui Hydroelectric Station	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Xinmiao substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
81	Sanhui Hydroelectric Plant	Sanhui 1 Sanhuiwei 2	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Sanhe substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
82	Qingshuihe Stage I Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Gangshang substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
83	Gongjiagou Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Tangjiagou substation via 35kv line finally to the grid through the Tangli line of 110kv, and the voltage changes from 35KV into 110KV
84	Chahe Stage III Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Sanhe substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV
85	Daihuanggou Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Sanhe substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV

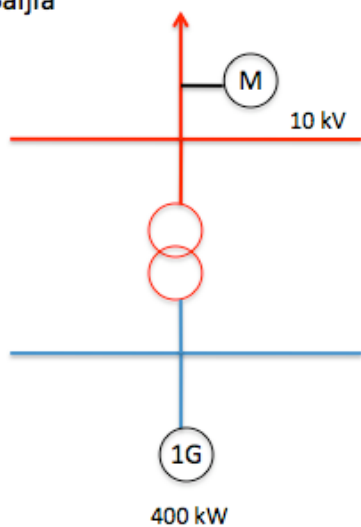
86	Gaoqiaohe Hydroelectric Plant	1	On the main transformer in the hydropower plant	The power is transmitted to Ya'an grid via Gangshang substation through 35kv line finally to the grid, and the voltage changes from 35KV into 110KV.
87	Zhuyeshan Hydroelectric Plant	0.1	On the main transformer in the hydropower plant	110KV-Dabao substation –Chinese central grid
88	Lianghekou Hydroelectric Plant	0.2	Switch Exit of line Yangcun35KV	The power is transmitted to Yangcun substation via Yang35KV and then through to Hetaoping substation finally to the grid, and the voltage changes from 35KV into 110KV when pass the booster station
90	Dabaishu Hydroelectric Plant	0.5S	Switch Exit of line Shiyun35KV	The power is transmitted to Shiyun substation , finally to the grid, and the voltage changes from 35KV into 110KV when pass the booster station
91	Dashi Stage III Hydroelectric Plant	0.2	Switch Exit of line Shiyun35KV	The power is transmitted to Shiyun substation , finally to the grid, and the voltage changes from 35KV into 110KV when pass the booster station
92	Dashi Stage II Hydroelectric Plant	0.2	Switch Exit of line Shiyun35KV	The power is transmitted to Shiyun substation , finally to the grid, and the voltage changes from 35KV into 110KV when pass the booster station
93	Yunnan Midu County Taishanhe Hydropower Station	0.2s	35kv Niujie Substation	The power is transformed from 6.3kv to 35kv on-site and then transmitted from Taishanhe power station through 3.1km transmission line to Niujie Substation in Midu County then to China Southern Power Grid.
94	Zhenyuan County Xiaojiehe Hydropower Station	0.5S	35kv Zhedong Substation	The power is transmitted from Xiaojiehe power station through 35kv Zhedong Substation via Pu'er substaion, finally to China Southern Power Grid, and the voltage changes from 6.3 kv to 35 kv when pass the Zhedong substation
95	Jinghong City Chuangye Hydropower Station	0.5S	on-site, at the point after power has been transformed to 35kV voltage.	The power is transformed from 6.3kv to 35kv on-site and then transmitted from Chuangye power station through 14km transmission line to Chengxi Substation in Jinghong City then to China Southern Power Grid.

96	Yingjiang Husa River 5th Stage Hydropower Plant	0.5s	On high voltage side of main transformer in substation	The power is transmitted to Husa River stage 4 substation via Yang35KV and finally to the Hongzhou grid, and the voltage changes from 35KV into 110KV when pass the booster station
97	Yunnan Province Jinping County Mengqiao Village Datan Hydropower Station	0.2	On high voltage side of main transformer in substation	The power is transmitted from Datan Power Station T-connected to a 110kv line which is from Mengqiao Power station and Lvshui Power Station via 2km 110KV line, finally to the grid
98	Fugong County Lishadi Hydropower Plant Project	0.2s	On high voltage side of main transformer in substation	The power is transmitted to Aluodi Switch station via Lia line 110KV and finally to the Lanfu line via 220KV

5.2 Monitoring Flow Diagrams for Sampling Projects

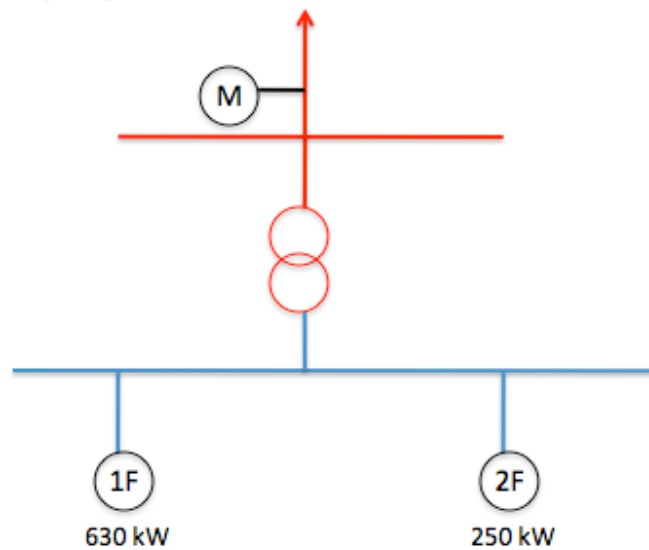


37. Baijia



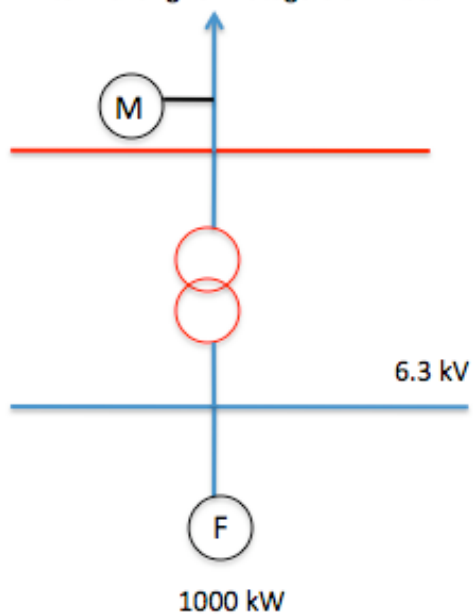
55. Canglong

to booster station

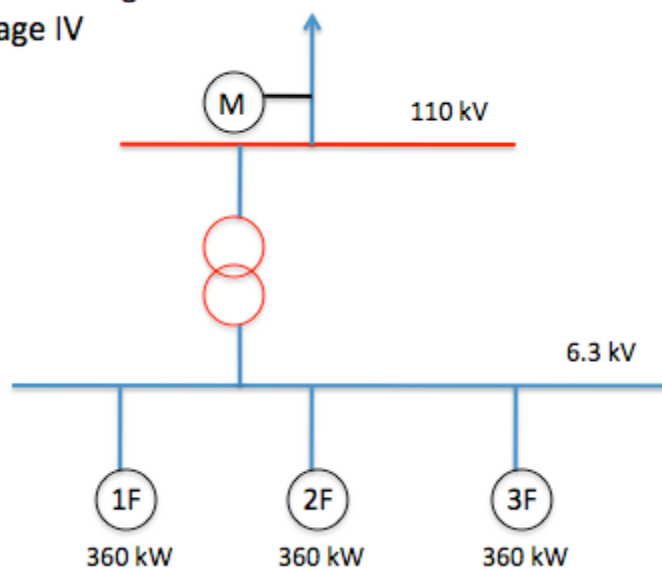


57. Heixigou

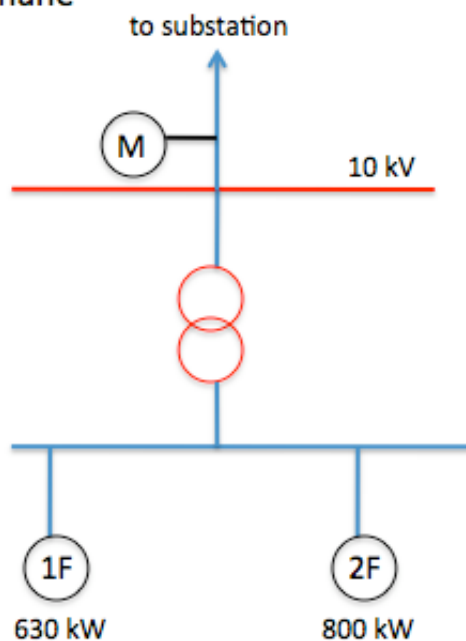
to Muzonghe III Stage 6.3 kV bus



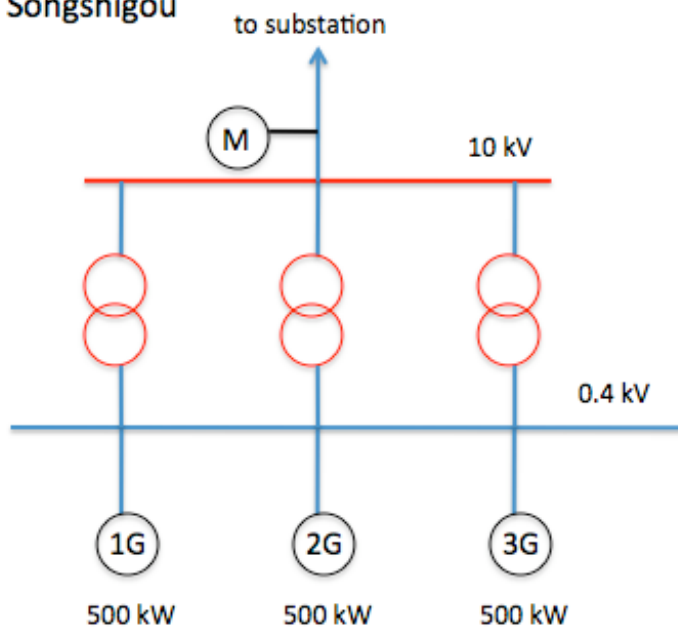
59. Muzonghe Stage IV



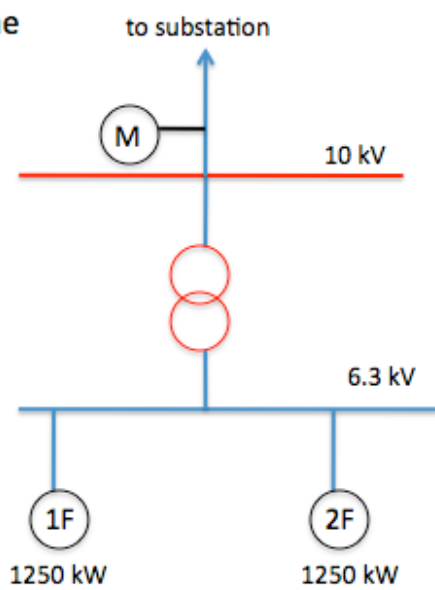
62. Shuangchahe



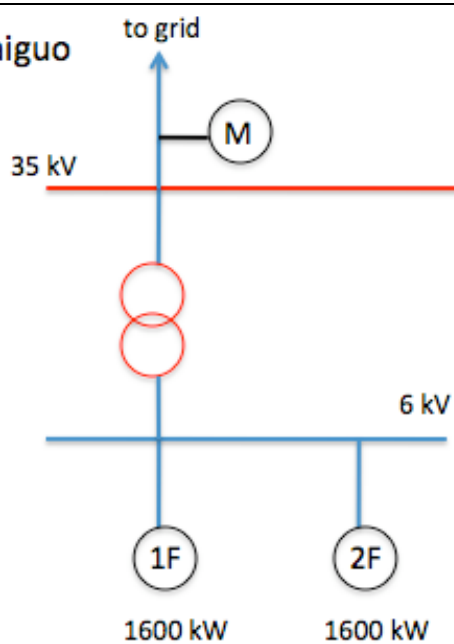
63. Songshigou

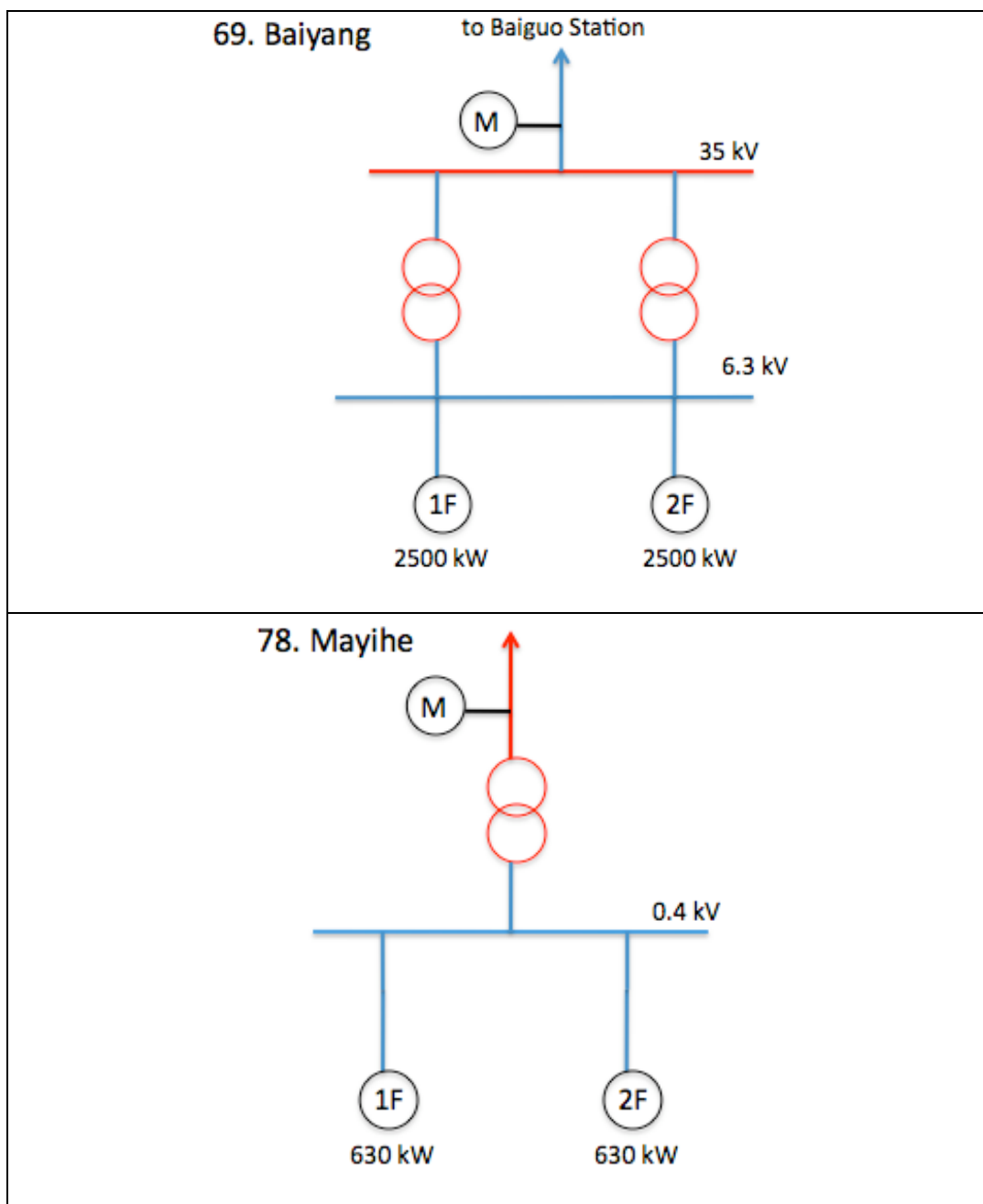


65. Shujiahe

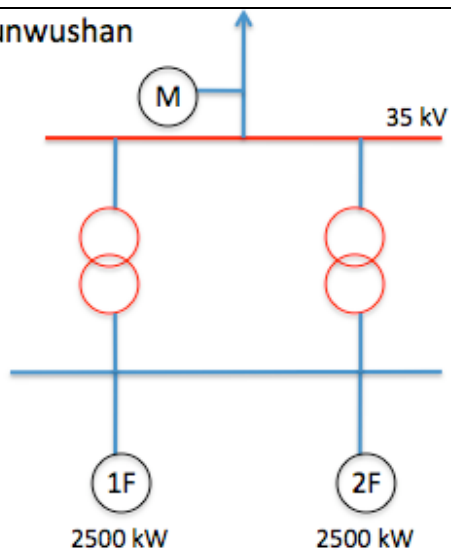


67. Baiguo

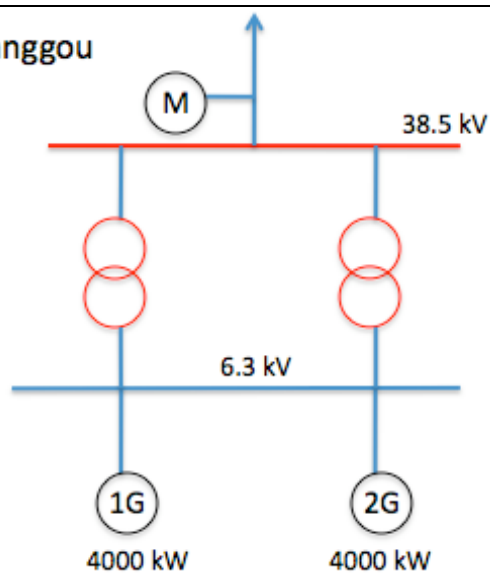




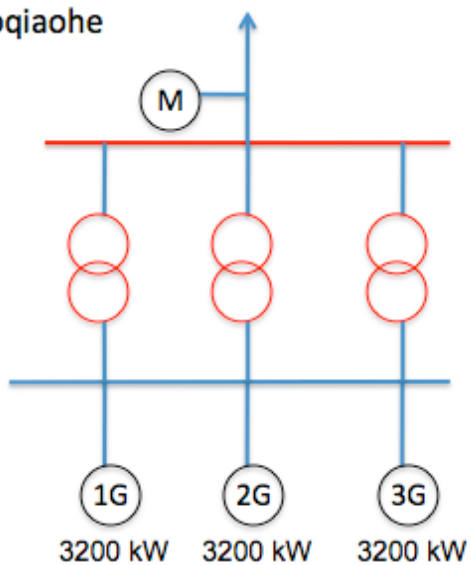
82. Yunwushan



85. Daihuanggou



86. Gaoqiaohe



90. Dabaishu

