工程设计证书
甲级 300102-sj

新疆乌鲁木齐托里100MW风电场

二期30MW项目

可行性研究报告

水利部　新疆维吾尔自治区水利水电勘测设计研究院

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从功率曲线比较，WTG1500B 比 WTG1500A 在低风速下发电效率高。用托里风电场 70m 测风塔推算以上各候选机型的威布尔参数见下表：

高度\参数	V	K	C
65m	8.42	1.96	9.62
67m	8.45	2.01	9.86
69m	8.48	2.12	10.18

5.3.2 上网电量计算

根据托里风电场的各高度的威布尔参数计算出的风速频率分布和风力发电机功率曲线，计算各候选风机在标准状态下的理论年发电量见下表：

风机编号	WTG1200	WTG1500A	WTG1500B	WTG2000
单机容量(kW)	1200	1500	1500	2000
台数	25	20	20	15
风机理论发电量(万kW时)	11869	11041	11708	11054
满负荷运行小时数(小时)	3956	3680	3903	3685

由于托里风电场的空气密度是 1.112 千克/m^3，而标准状态的空气密度是 1.225 千克/m^3，所以要将各厂家的功率曲线修正到现场条件下。另外，风电场运行后还有风机的尾流影响、叶片被油或灰尘污染引起的电量损失、线损、电网及变电所故障、检修停机等都会引起上网电量的减少。根据同行业经验来估计各种影响因素：叶片脏 3.50%、尾流 3.50%、线损 5%、电网、变电所故障 2%、检修 1.5%，合计 15.5%。综合以上因素，计算得到各机型的上网电量计算如下：

风 机 编 号	WTG1200	WTG1500A	WTG1500B	WTG2000
单机容量(kW)	1200	1500	1500	2000
台数	25	20	20	15
托里风电场发电量(万kW时)	11343	10543	11211	10484
满负荷运行小时数(小时)	3781	3514	3737	3495
折减后上网电量(万kW时)	9584	8908	9473	8858
满负荷运行小时数(小时)	3195	2969	3158	2953
容量系数	0.36	0.34	0.36	0.34

经比较 WTG1200 机型发电量最高，WTG1500B 居次，但这两种机型

没有运行记录，不确定因素较多，所以不建议采用。WTG1500A 型和 WTG2000 型风机都有运行记录，可信度较高，WTG1500A 型风力发电机组发电量稍高，20 台 1500kW 风机年上网电量为 8908 万 kW 时，折合满负荷发电小时为 2969 小时，因此推荐采用 WTG1500A 型变速恒频变桨距的风力发电机组。

Certification of Qualification with Project Design

A Grade 300102—sj

Xinjiang Urumqi Tuoli 100MW Wind Power Farm Phase II 30MW Project*

Feasibility Study Report

Xinjiang Uigur Autonomous Water Conservancy and hydropower Survey and Design Institute

Ministry of Water Resource，China

Urumqi April 2006

* **This project is renamed as Xinjiang Urumqi Wulabo 30MW Wind Farm Project in CDM PDD**

5.3.2 The calculation of on-grid power supply

The theoretical on-grid power supply of each kind of wind turbines is anticipated based on the calculated speed/frequency of local wind resource from the Weibull Parameters of this project site which is based on the statistical data of several years and power generation curves of each turbine in the ideal operation environmental condition as following table:

Wind turbines	WTG1200	WTG1500A	WTG1500B	WTG2000
(kW)	1200	1500	1500	2000
Quantity	25	20	20	15
The theoretical on-grid power supply (10MWh)	11869	11041	11708	11054
Operation hours(h)	3956	3680	3903	3685

Considering as the actual operation environment, the on-grid power supply of each wind turbines is shown in following table:

Wind turbines	WTG1200	WTG1500A	WTG1500B	WTG2000
(kW)	1200	1500	1500	2000
Quantity	25	20	20	15
The project on-grid power supply (10MWh)	9584	8908	9473	8858
The project Operation hours(h)	3195	2969	3158	2953

Through this table, we can see the theoretical on-grid power supply of WTG1200 and WTG1500B are more than WTG1500Q's. Both WTG1200 and WTG1500B have no operation experience and less of certainty, so these two turbines are not recommended. WTG1500A has a better operation experience, so it is recommended as the project turbine. The on-grid power supply of the chosen wind turbine is about 89080MWh, about 2969 operation hours.