

SHP in China

Framework for Chinese Private Sector's Participation in Rural Hydropower 2

HRC's expert attended the 4th World Water Forum 5

Environmental Integration of Small Hydropower Development 6

SHP Development and Programme Worldwide

Climate Change in Scotland: Impact on Mini-Hydro 15

Vietnam continues mini hydro drive 20

Land Use Pattern for Piluwkhola Small Hydropower Project 21

HRC's expert attended project appraisal of "Management of Hydro Power Development 2005, Part II" in Vietnam 24

Water intake of Tri An hydro-power plant, Vietnam 24

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Framework for Chinese Private Sector's Participation in Rural Hydropower

Remarkable achievements have been scored for the development of rural hydropower and rural electrification in China. A total of 653 small hydropower (SHP)-based rural electrification counties have been completed. In recent years, numerous private investments poured into the field of rural hydropower to greatly accelerate the course of rural electrification. This article aims to focus on the general situation and background for private sector's participation in rural hydropower development in China, and the current operation system and mechanism for the joint-development of public and private sectors in rural hydropower development. 2

Environmental Integration of Small Hydropower Development

Guidelines of small hydropower development dealing with environmental protection were suggested hereby. Various specific technical environmental solutions focusing on small hydropower development applied in European and other developed countries were also introduced in this paper. Main environmental solutions are discussed as follows: integrated design should be advocated during plan/design stage; eco-hydraulic engineering and its utilization in SHP design and construction; effective technical approaches to relieve and eliminate the impact of river interception and fix the reasonable minimum biological flow; environment-friendly mitigation and compensation measures for high/low-head hydropower schemes applied in diversion works, intake, nature-like fish-passes, penstock and powerhouse design; study and application of the new technology, material and equipments; launching renovation of environmental protection in existing stations; emphasizing public participation and their acceptability for the SHP environment; coordinated inter-disciplinary study at national level. etc. Two case studies in Sweden and Australia are given here. 6

Climate Change in Scotland: Impact on Mini-Hydro

UK Government targets for renewable energy and the new Renewable Obligations suggest a renewed interest in mini-hydropower. However, changes in climate and, in particular precipitation, have been shown to significantly alter the quantity and distribution of river flows. Furthermore, these changes have been shown to impact on the production and, consequently, the economics of large hydropower schemes. The literature highlights that the sensitivity of production to changes in climate increases significantly as the amount of storage declines. Given that run-of-river mini-hydropower schemes have little or no storage they may be particularly vulnerable to the changes in river flow quantity and distribution that result from climate change. To assess the threat, a simple software model has been developed that enables an examination of the sensitivity of mini-hydro production and economics to climate change. A possible low-head scheme located in the Scottish Borders is used as a case study. 15

FRONT COVER:Water intake of Tri An hydropower plant, Vietnam(p24)

INSIDE FRONT COVER:About the " Small Hydropower "

INSIDE BACK COVER:About the Newsletter

BACK COVER:HRC Scope of Business

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