

POWER TARIFF POLICY FOR BHUTAN

**Presentation to BCCI
9th November 2005**

Department of Energy

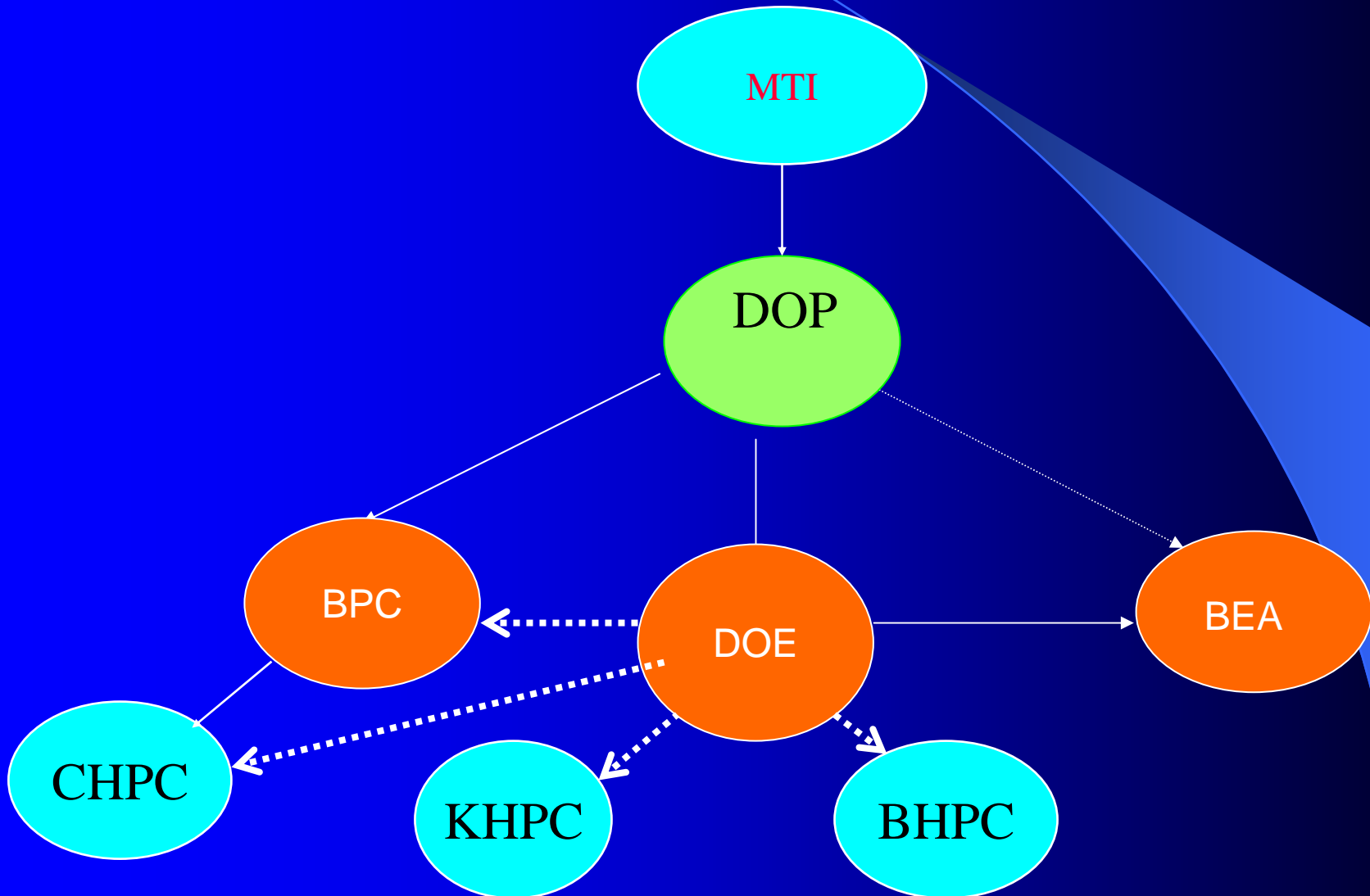
Presentation format

- Power Sector Mandate
- Reforms in the power sector
- Summary of Hydropower potential
- Electricity demand, projections & implications
- Generation targets
- Power Dilemma & Policy interventions
- Power availability for domestic consumption

POWER SECTOR MANDATE

- i. Meet the electricity requirements of the Country both for household consumption and industrial demand in a safe, reliable and affordable manner.
- ii. Ensure that revenue from export of power continue to grow thereby contributing to the Royal Government's goal of achieving economic self reliance.

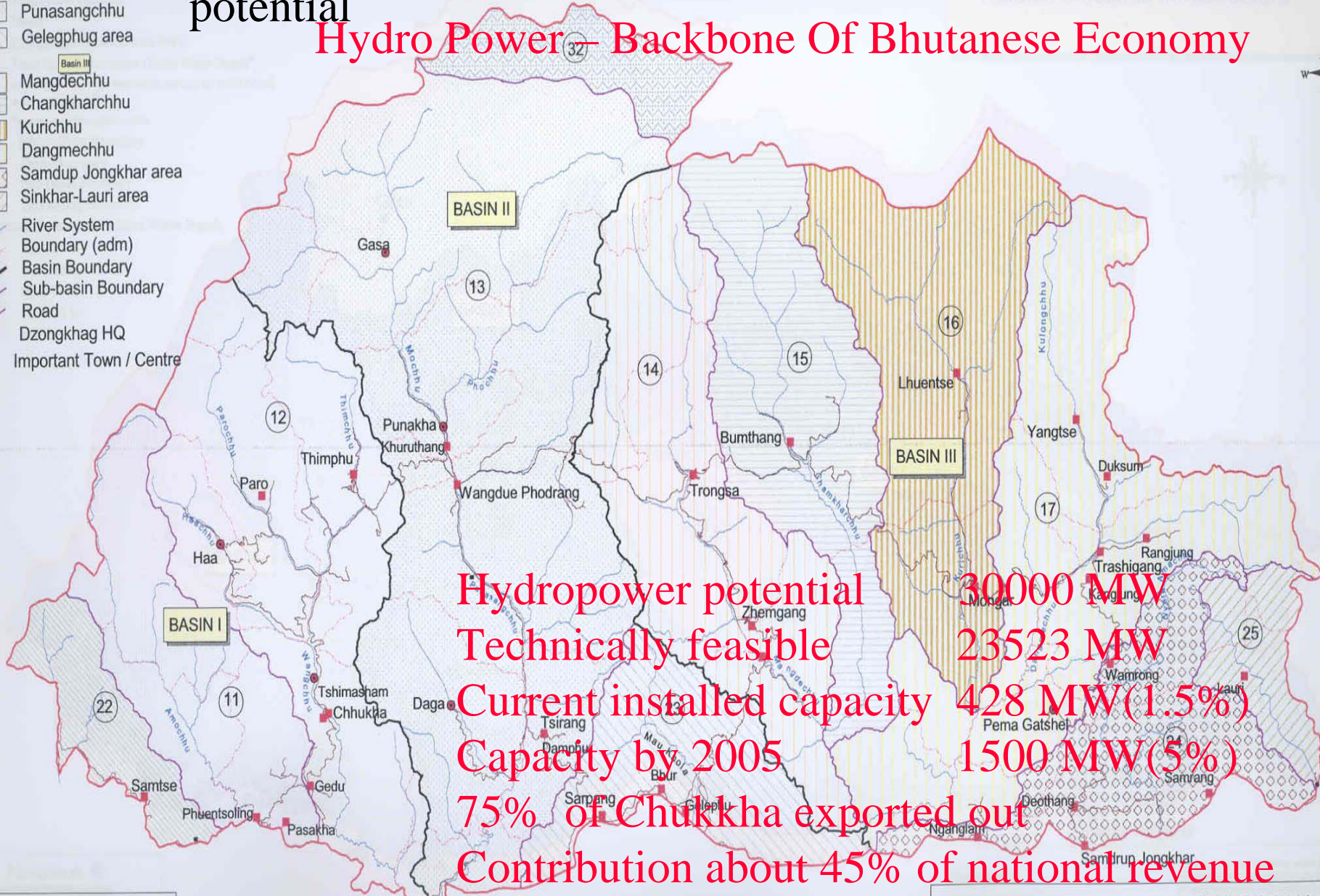
REFORMS IN THE POWER SECTOR (With effect from 1st July 2002)



Summary of hydropower potential

Hydro Power – Backbone Of Bhutanese Economy

- (22) Samchi area
- (11) Amochhu
- (12) Wangchhu
- Basin I**
- (32) Drainage to China
- (13) Punasangchhu
- (23) Gelegphug area
- Basin II**
- (14) Mangdechhu
- (15) Changkharchhu
- (16) Kurichhu
- (17) Dangmechhu
- (24) Samdup Jongkhar area
- (25) Sinkhar-Lauri area
- River System
- Boundary (adm)
- Basin Boundary
- Sub-basin Boundary
- Road
- Dzongkhag HQ
- Important Town / Centre



Hydropower potential 30000 MW
 Technically feasible 23523 MW
 Current installed capacity 428 MW (1.5%)
 Capacity by 2005 1500 MW (5%)
 75% of Chhukha exported out
 Contribution about 45% of national revenue

Electricity demand scenario

- 105 MW and 664 mu in 2002-03 from 70 MW and 345 mu in 1995-96 (11% growth)
- 9th Plan about 12% growth mainly on increased coverage and industrial demand.
- By 2006, 1500MW capacity, firm 293MW.
- 12MW per annum to be added during the 9th Plan to avoid reduction in export.
- Electricity for all by 2020 (USD 130 m)
- Have a clear strategy so that domestic demand does not eat into export.

Projected electricity demand of Bhutan

Year	2002	2005	2007	2010	2012	2014	2017	2020
Demand (mu)	664	932	1169	1473	1718	1967	2410	2533
Peak D (MW)	105	152	190	240	280	320	393	413

Assumption : 02-07, 12%; 07-12, 8%; 12-17, 7%; 17-22, 6%. 7

DOMESTIC DEMAND IMPLICATIONS

- Based on existing demand forecast, there will be no power available for export by 2012 during the lean season.
- Import will become necessary.
- Direct revenue from export of power will reduce thereby putting pressure on the RGoB for funding social sectors.
- Domestic tariff would go to export levels, effecting power intensive industries.
- Need to add at least 12 MW firm power per annum during the 9th Plan to meet domestic demand without effecting export.

GENERATION TARGETS UPTO 2024

S/N	Plant name	Y.O.C	Capacity (MW)	Firm power (MW)	Energy (MU)	D/E
1	Chukkha	1986	336	84	1700	D/E
2	Kurichu	2001	60	24	400	D/E
3	Basochhu u/s	2002	24	5	105	D
4	Basochhu l/s	2004	40	10	186	D
5	Tala	2006	1020	170	4865	D/E
6	Punatsangchu 1	2012	870	160	4330	E
7	Mangedchu	2014	360	94	2000	E
8	Punatsangchu 2	2017	990	165	4667	E
9	Chamkarchu 2	2022	670	113	3207	E
10	Chamkarchu 1	2023	570	95	2713	E
11	Kholongchu	2024	326	61	1506	E
	Total		5476	981	26519	

Power Dilemma

- Should we encourage power intensive industries? If so up to what level of generation.
- 1 MW increase in domestic demand results in about Nu 14.89 million loss in direct cash to the RGoB by virtue of opportunity cost of domestic consumption.
- On the other hand bringing domestic tariff closer to export would make power intensive industries unviable ?
- How can we have a win win situation – i.e domestic tariff remains affordable while at the same time export earnings continue to grow ?

POLICY INTERVENTIONS

- 15% of energy from export gencos allocate for domestic use.
- Whole sale rate to BPC fixed at Nu 0.30 per unit for the time being.
- Introduction of bulk supplier.
- Wheeling charges from export as subsidy for rural electrification.
- No CIT on domestic power tariff.

Power availability for domestic consumption

S/N	Plant name	Y.O.C	Capacity (MW)	Firm power (MW)	Energy (MU)	Domestic	
						MU	MW
1	Chukkha	1986	336	84	1870	280	36
2	Kurichu	2001	60	24	400	400	24
3	Basochhu u/s	2002	24	5	105	105	5
4	Basochhu l/s	2004	40	10	186	186	10
5	Tala	2006	1020	170	4865	730	93
6	Punatsangchu 1	2012	1080	160	5000	750	95
7	Mangedchu	2014	360	94	2000	300	38
8	Punatsangchu 2	2017	990	165	4667	700	88
9	Chamkarchu 2	2022	670	113	3207	481	61
10	Chamkarchu 1	2023	570	95	2713	407	52
11	Kholongchu	2024	326	61	1506	226	27
	Total		5476	981	26519	4564	529 ₂