

POWER TARIFF PRESENTATION TO BCCI

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Bhutan Electricity Authority
Department of Energy
9 November 2005

OVERVIEW

1. ELECTRICITY ACT 2001
 - Bhutan Electricity Authority
 - Functions
 - Current Status

2. TARIFF APPROVAL PROCESS
 - Current Approval Process
 - Future Approval Process

3. FINANCIAL ANALYSIS & PROJECTIONS
 - BPC Financial Analysis
 - Generation Companies Financial Analysis
 - Tariff Trends

PURPOSES OF THE ELECT. ACT

Section 2

- Restructuring of the Electricity Supply Industry (ESI)
- Establishment of the BEA
- Technical Regulation of ESI (Gen, Tran, Dist, Supply)
- Private Sector Participation
- Empower Government to form Companies

OBJECTIVES OF THE ELECT. ACT

Section 3

- Safe and reliable electricity supply
- Enhance revenue generation
- Develop socio-economic welfare
- Economic self-reliance thru viable elect. Indust.
- Promote development of renewables
- Address environmental concerns
- Promote efficiency in management and supply of electricity

BEA

- **An autonomous body corporate**
- **Not part of the Ministry**

To consist of :

- **A Chairman**
- **Not less than three members**
- **CEO with secretariat**

FUNCTIONS OF THE BEA

SECTION 11

REGULATIONS

- **Technical regulations**
- **Economic regulations**
- **Accounting and reporting requirements**

LICENSING

- **Issuing licenses**
- **Compliance monitoring**
- **Fees, charges, fines determination**

DISPUTE RESOLUTION

- **Consumer grievance redressal**

TARIFF PRINCIPLES

Section 14.1

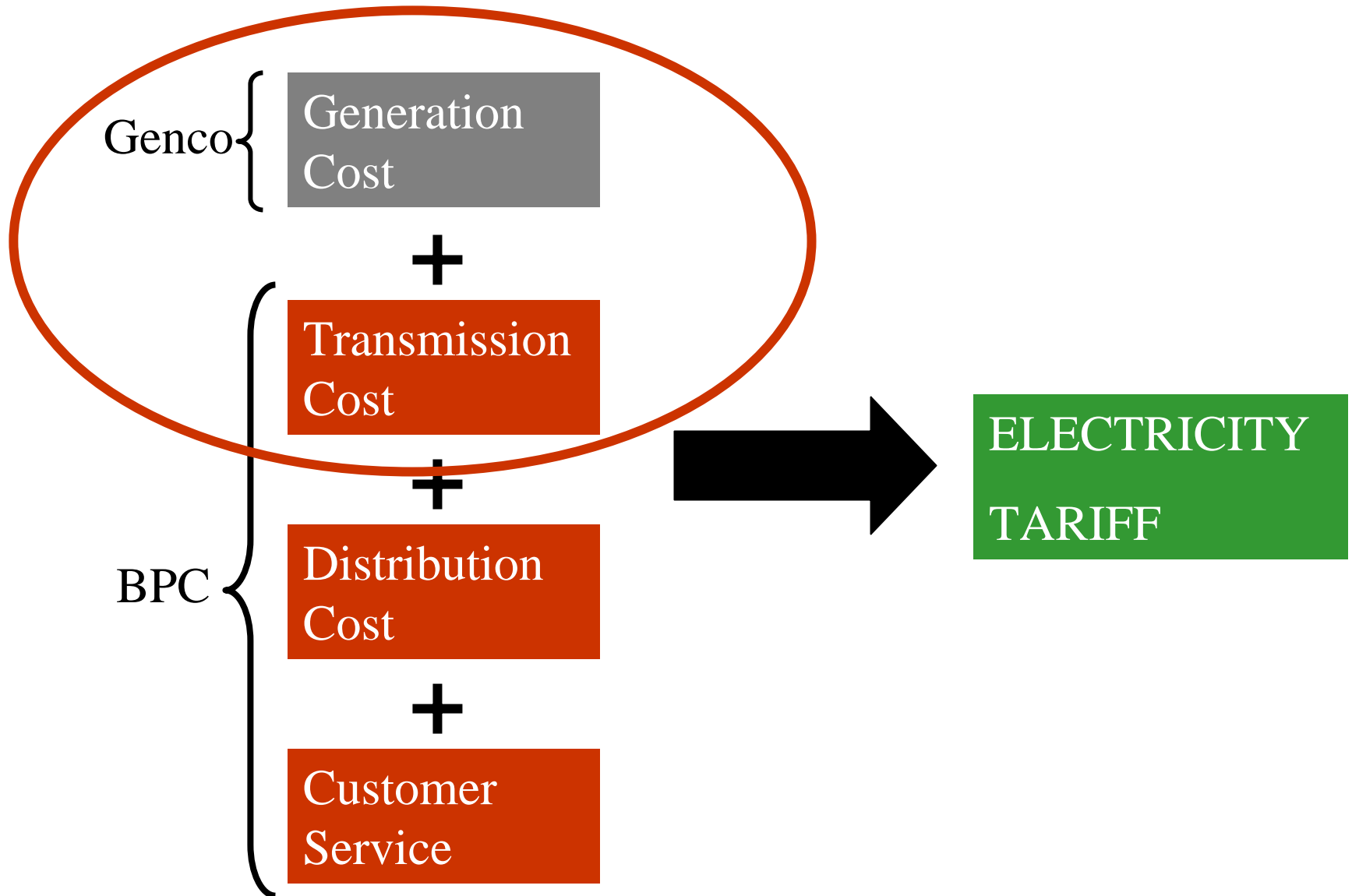
Tariffs should be regulated according to the following principles:

- **Fairness**
- **No unjust discrimination**
- **Reflect actual cost**
- **Lead to efficiency improvement**
- **Efficient and adequate supply to meet needs**
- **Public announcement**
- **Tariff calculations must be explicit**

TARIFF REGULATIONS

1. BEA formula
2. Subsidies to be explicit
3. Accurate cost information and transparency
4. Costs plus rate of return (RoR)
5. BEA to set RoR
6. Efficiency and productivity targets
7. Six months approval period

TARIFF COST STRUCTURE



ELECT. ACT SUBSIDY PRINCPLS

Section 61

Rural electrification to be supported

Section 11.1.c

Develop principles and procedures for subsidies to entities carrying out non-economically viable electricity supply based on policies and plans set by the Minister.

Section 60

Levies may be charged to recovery of costs incurred in delivery of electricity to rural or remote consumers.

BEA CURRENT STATUS

- Newly created organization
- Still part of the Dept. of Energy
- Building up institutional capacity
- Framing regulations (ADB/NORAD)

Autonomous by 2006

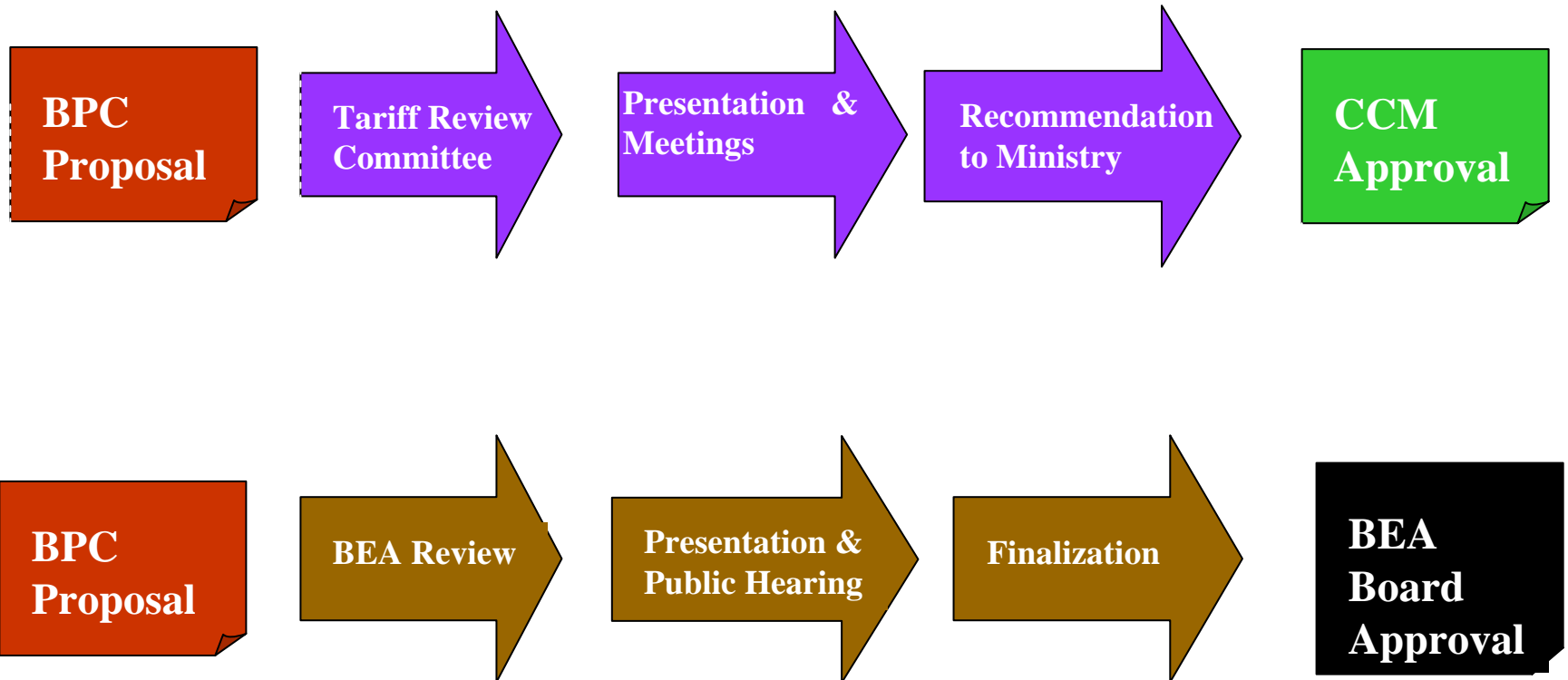
CURRENT APPROVAL PROCESS

Tariffs for 2004-2005, 2005-2006, 2006-2007

Domestic Tariff Review Committee:

- Ministry of Trade & Industry 4 members
- Ministry of Finance 4 members
- Department of Energy 2 members

TARIFF APPROVAL PROCESS



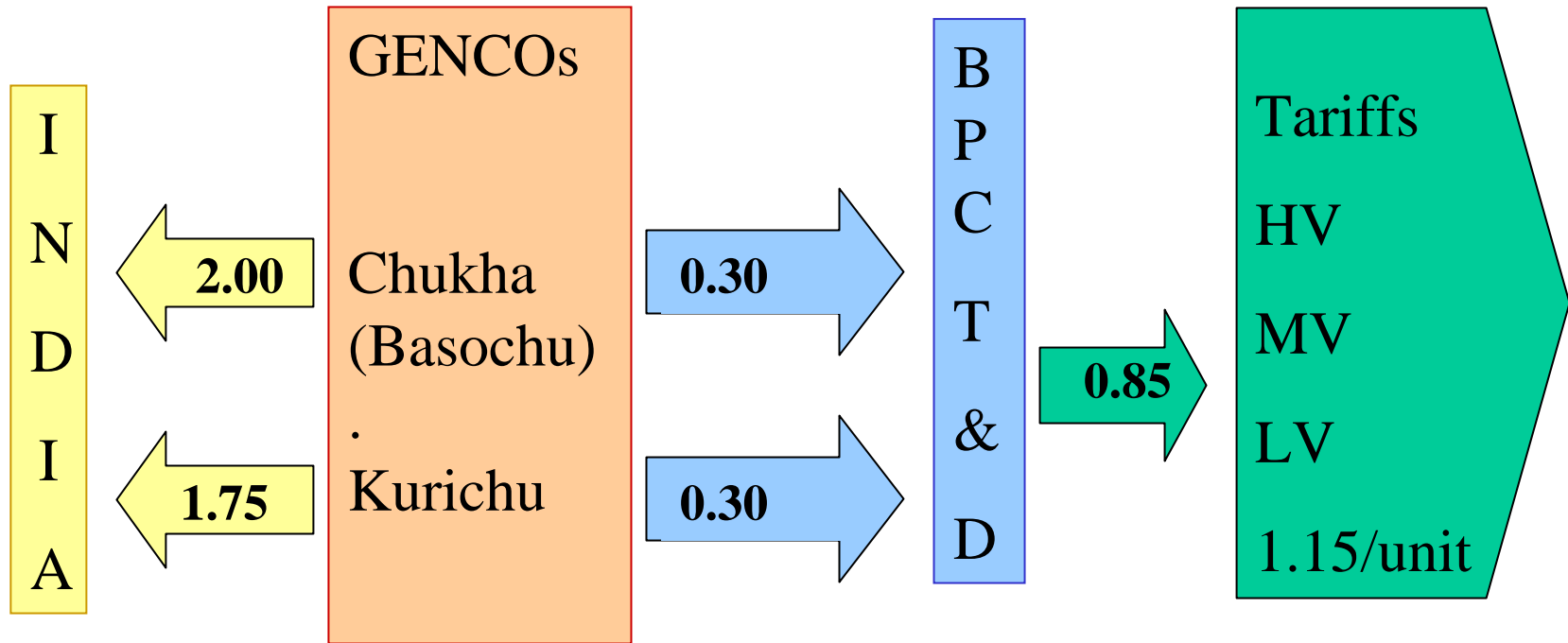
BPC SITUATION

2002-2003	BPC Loss	Nu. 68.1m
2003-2004	BPC Loss	Nu. 27.7m
Total Loss		Nu. 95.8m

Audit comment:

At present tariffs, the more BPC invests, the more losses it will make

CURRENT TARIFF STRUCTURE



EXISTING SUBSIDY POLICY

Subsidy in Generation:

- No RoR for export oriented Projects
- Subsidized 6% RoR for domestic oriented Projects
- Commercial RoR is 14%
- CIT not included in tariff calculation

Subsidy in Transmission

- Subsidized 6% RoR for transmission network
- Commercial RoR is 14%
- CIT not included in tariff calculation
- Major transmission trunk linked to generation projects

BASIS FOR CURRENT HV TARIFF

Opportunity Cost of Export:

Generation Cost:	Export price	Nu. 1.88
Transmission Cost:	Export wheeling	Nu. 0.12
Total		Nu. 2.00

TARIFF ELEMENTS

- Employee Cost
- Operation and Maintenance
- Depreciation
- Loan Interest
- Financial Charges (Working Cap, Bad Debt)
- Return on Investment

BPC CURRENT TRANS. COST

Current Costs

Export Transmission Assets

Nu. 757m

Units wheeled

1779 MU

Wheeling Charge

Ch. 06/unit

Domestic Assets

Nu. 1,405m

Units wheeled

654 MU

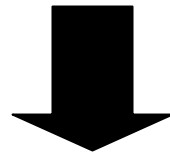
Wheeling Charge

Ch. 28/unit

BPC FUTURE TRANS. COST

Additional Transmission Infrastructure

- Rurichu - Semtokha line
- Rurichu -Tsirang / Dagana-Gelephu line
- Tingtibi – Trongsa/Bumthang line
- Pasakha Industrial Estate
- Phuntsholing - Samtse line
- Deothang-Rangia line
- Tala System with Malbase substation
- National Load Dispatch Center



Nu 9,530m

BPC TRANSMISSION COST

Additional Transmission Costs

Additional Assets	Nu. 9,350m
Additional Units wheeled	900 MU
Wheeling Charge	Nu. 1.03/unit

Expected Wheeling Charge

Current Wheeling (654MU)	Nu 0.28/unit
Future Wheeling (900MU)	Nu. 1.03/unit
Final Average Wheeling Charge	Nu. 0.72/unit



**Future
Transmission
Rate**

GENCO PROJECT DETAILS

	Chukha	Basochu	Kurichu	Tala	Total
Installed Capacity (MW)	336	64	60	1020	1144
Generation (MU)	1745	291	400	3914	4605
Firm Power (MW)	84	15	18	170	203
Total Cost (mill)	3,110	3,919	6,671	48,000	58,590
Loan %	40%	62%	40%	40%	
Interest Rate	5%	6%	11%	9%	
Loan Period	15	25	12	12	

GENERATION POLICY

Rate of Return Policy

Domestic GENCOS
(Basochu, Kurichu)

RoR=6%

Export GENCOS (Chukha, Tala)

Upto 15% of generation

RoR=0%

Beyond 15% generation

Export Rate

Tax Policy

Corporate Tax not included in RoR calculation

GENCO COST (Upto 15% limit)

GENCOs	Domestic Usage (MU)	RoE	Sale Rate
Basochu	291	6%	1.20
Kurichu	395	6%	1.75
Chukha (15%)	280.5	0%	0.28
Tala (15%)	729.75	0%	0.93
Average	1696.25		1.06

GENCO COST(Over 15%)

GENCOs	Domestic	Export	Sale
25% Usage	Usage (MU)	Rate	Rate
Basochu	291	1.50	1.20
Kurichu	395	1.75	1.75
Chukha (25%)	467.5	2.00	.28, 2.0
Tala (25%)	1216.25	2.00	.92, 2.0
Average	2369.75		1.33

HYDRO VIS-À-VIS INDUSTRIES

General comments:

- RGoB revenues decrease as industries increase
- Firm power inadequate so power imported at higher rates in the lean season is sold at lower rates to industries
- Kurichu will have cashflow problems when Ferro-alloy industry starts in Eastern Bhutan
- How to ensure sustainability of hydro-power projects?

Recommendations:

- Limit usage to 15% of mean energy generation for export oriented companies

FIRM POWER FORECAST

	Firm Power (MW)
BHPC	15
CHPC	84
KHPC	18
TALA	170
TOTAL	287

Demand Forecast (MW)							
	2005	2006	2007	2008	2009	2010	2011
Total Western	131.4	167	228	244	258	276	296
Total Central&Eastern	27.68	34.2	56.2	61.7	67.9	79.2	91.2
Total	159.1	202	285	306	326	355	387
Firm Power Exceeded from 2008 onwards							

2003-2004 Import Details

IMPORTS FROM INDIA

➤ West Bengal	(1.5MU)	Nu. 1.88/unit
➤ Assam	(1.2MU)	Nu. 2.16/unit
➤ PGCIL	(22MU)	Nu. 1.55/unit
➤ Total Cost	(24.7)	Nu. 40 mill
➤ BPC recovery		Nu. 24.7 mill
➤ Total Cash Subsidy		Nu. 15.3 mill

KURICHU CASHFLOW PROBLEM

CASHFLOW ANALYSIS	2004	2005	2006	2007	2008	2009	2010
Loan Interest Payment	100.84	201.7	201.7	201.7	201.7	201.7	201.7
Principal Repayment	93.33	186.7	186.7	186.7	186.7	186.7	186.7
O&M Costs	63.70	66.57	69.57	72.7	75.97	79.39	82.96
Wheeling Charges	46.4	35.59	34.04	24.35	23.07	21.58	18.72
Cashflow requirement	304.28	490.5	492	485.4	487.4	489.3	490
Current Cashflow	553.72	507.3	486.2	374.6	376.6	356.6	317.3
Net Cashflow Situation	249.43	16.78	-5.76	-110	-112	-133	-173

This scenarios only considers Ferro Alloy in S/J. It gets worse once Dungsam come up

FIRM POWER SITUATION

Peak Load

2004 Winter	120MW
2005 Winter Forecast	140MW

Industries Coming Up

170 MW

Pasakha New Indst. Estate	129.6MW
BCCL/BFAL Augmentation	23.33MW
Samdrup Jongkhar	16.2MW

TARGET HV TARIFFS

	Within 15% limit	At 25% level
Generation Cost	1.06	1.33
Transmission Cost	0.72	0.72
Total	1.78	2.05

LIKELY HV TARIFF TREND

Year	Rate/Unit
2005-2006	1.15
2006-2007	1.29
2007-2008	1.42
2008-2009	1.56
2009-2010	1.72
2010-2011	1.89

HV TARIFF COMPARISON

Country/States	Energy Charge (Nu./kWh)	Fixed Charge (Nu./kW/KVA)
Bhutan	1.05	54
Nepal (2001)	3.59	119
West Bengal	4.30	10
Assam	3.50	150
Andhra Pradesh	3.25	195
Meghalaya	2.05	80

Tariffs in Bhutan are still the lowest in the region by a wide margin

WAY FORWARD

If tariffs are to remain low (around Nu. 1.8unit), the following may be required:

- Limit domestic demand to 15% of total export generation;
- New generation needs to be added as per targets set in the Power System Master Plan;
- Industrial development should occur in phased manner in line with generation addition.
- Industries should be located in areas where power is available so that infrastructure cost is reduced;
- Import of power has to avoided



THANK YOU