

National Conference on Sustainable Urban Transformation, New Delhi



Sustainability in Fossil Fuel Supply Chain



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About DVC

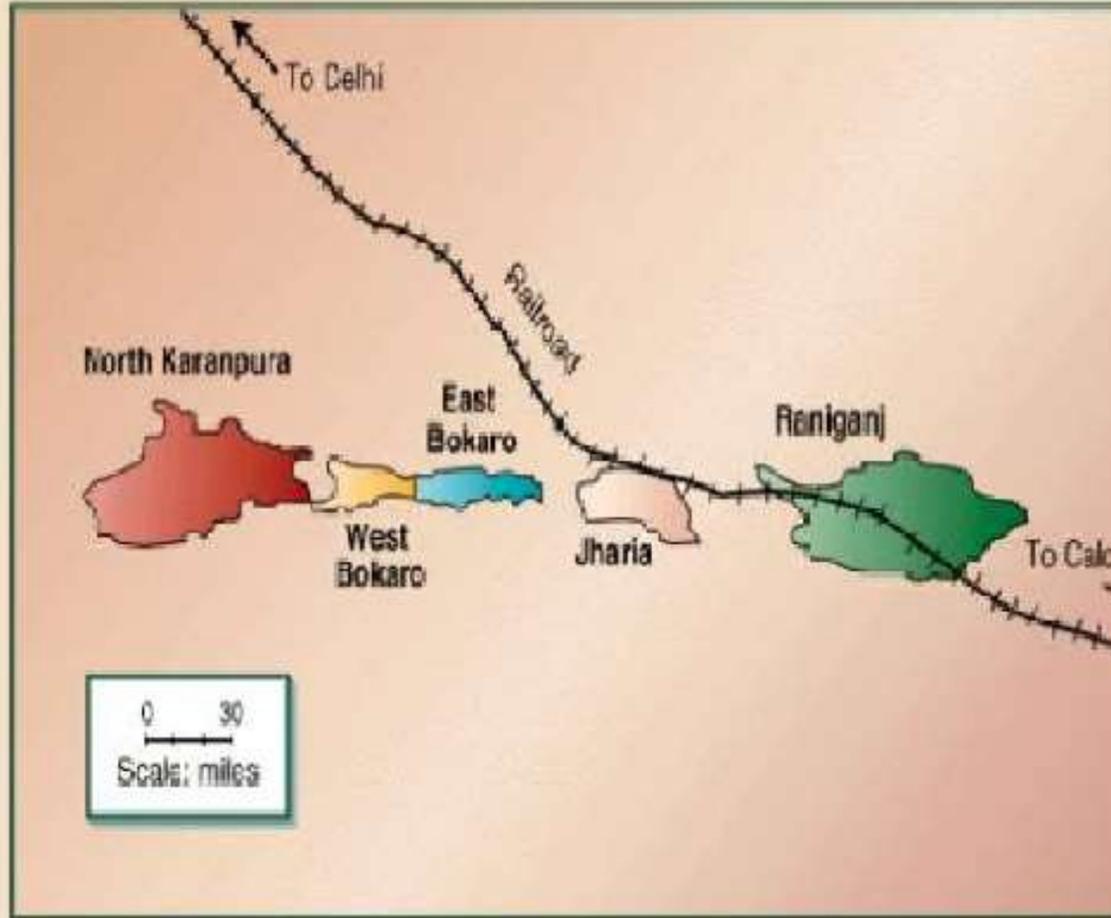


Damodar Valley Corporation (DVC) came into being on 7th July, 1948 by an Act (Act No. XIV) of the Constituent Assembly as the first multipurpose river valley project of Independent India on the lines of Tennessee Valley Authority (TVA) of USA. DVC command area is spread over 24,235 sq.kms in Jharkhand & West Bengal.

- Inception of DVC turned the mighty river Damodar from “River of sorrow” to “River of fortune”. DVC, over the years, contributed immensely towards social upliftment and economic wellbeing of the people residing in valley area. Electricity generated from its power stations helped to promote industrial growth in its operational area.
- Completed 78 years of its journey in service of the nation, in true sustainable way and transforming lives through water resource development and power generation in India.

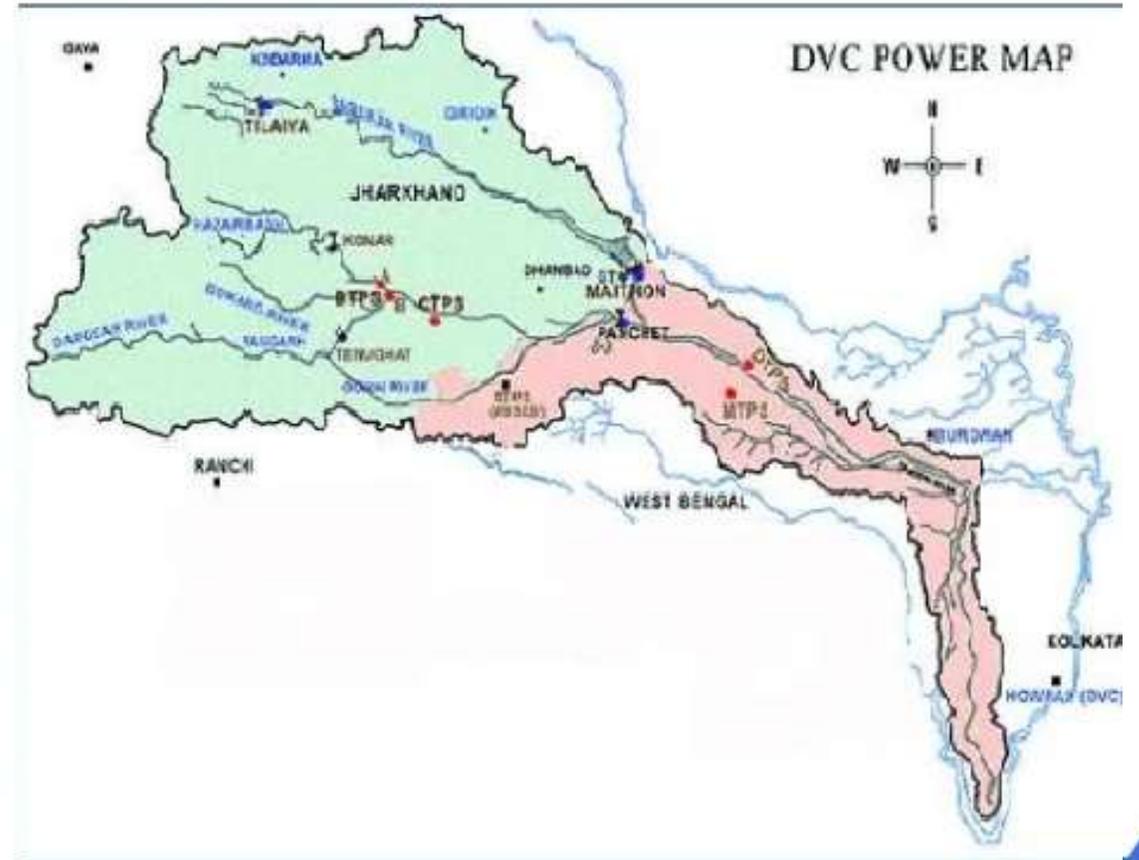


COAL FIELDS OF THE DAMODAR VALLEY



Source: Advanced Resources International Inc.

Location of power generation stations



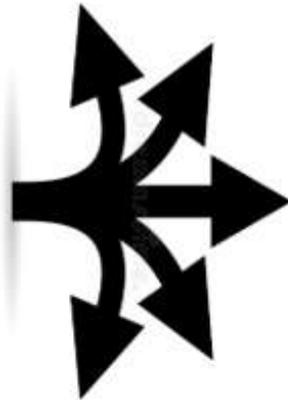
Expansion Roadmap

Sl. No.	Present Capacity (MW)	Type of Plant	FY wise Addition									
			23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	
1	6540	Thermal Power Plants (MW)	Raghunathpur Ph-II (supercritical)	--	--	--	--	660	660	--	--	--
			Durgapur TPS (Ultra-Supercritical)	--	--	--	--	--	800	--	--	--
			Koderma Ph-II (Ultra-Supercritical)	--	--	--	--	800	800	--	--	--
			Chandrapura (Ultra-Supercritical)									800
2	0.103	Solar	Floating Solar (MW ^P)	0	310	679	400	400			--	--
3	13.82		Rooftop/Ground Mounted Solar (MW ^P)	20	60	160	200	300	300	300	300	--
	147.2	Hydel		--	--	--	--	--	--	--	--	--
5		Pump Storage (MW)	Lugu Pahar	--	--	--	--	--	--	--	1500	--
			Panchet Hill	--	--	--	--	--	--	--	--	--
	6701.12	Total		14	370	839	600	2160	2560	300	1800	1800
	6701.12	Aggregate Capacity		6701	7081	7920	8520	10680	13240	13540	15340	17140
	2.41	% of Renewable Capacity		2.41	7.64	17.43	23.24	25.09	22.51	24.23	33.12	35.47

Thermal capacity addition 9320 MW by FY 2031-32 and solar 4669 MW and Pump storage plants 2500 MW by 2031-32 Renewable capacity addition 35.47% Total 17140 MW by FY 2031-32.

CHALLENGES IN COAL POWER VALUE CHAIN

Fuel constitutes a major pie in a generation set-up and is faced with a multitude of challenges despite the encouraging growth trajectory in the energy space over the last few years. Despite Indian being second largest producer of coal, Indian Power sector still faces a herculean task of matching the demand versus supply gap & 24x7 Electricity for all.



COMPETITIVE TARIFF POSED DUE TO ENTRY OF RENEWABLES & FLEXI OPERATION

COMPLIANCES TO REGULATORY & ENVIRONMENT NORMS (FGD, SOX, NOX)

FINANCIAL HEALTH OF GENERATOR

COAL QUALITY ASSURANCES

OPTIMISATION OF FUEL COSTING & ECR

COAL PROCUREMENT, BLENDING OF DOMESTICS, COMMERCIAL & IMPORT COALS AND BIOMASS.

VOLATILE SOCIO-POLITICAL FRAMEWORK, MARKET DYNAMICS AND DIGITALIZATIONS

FUEL SECURITY CONCERNS - PRODUCTION , LOGISTICS AND PRICE RESPONSIVE DEMAND WOES

MULTIPLE CHALLENGES POSED DUE TO SUPPLY CHAIN DISRUPTIONS

Coal Supply Chain Management is most interesting but
Complex business

A typical Coal Supply Chain for Thermal Power Plant



Sustainability in Coal supply Chain

◆ First Mile Connectivity (FMC)

- Objective: Eliminate road transport near mines to reduce pollution, congestion, and costs.
- Mechanism:
 - Use of conveyor belts, in-pit crushers, and automated loading systems to move coal from mines to railway sidings.
 - 67 FMC projects with a capacity of 885 million tonnes (MT) are underway, aiming for 1 billion tonnes of mechanized handling.
- Environmental Impact: Reduces truck traffic, lowers emissions, and improves air quality

◆ Rail-Based & Multi-modal Evacuation

- Dedicated railway lines are being built to connect FMC points to the national rail network.
- 13 new railway lines are under construction to support coal evacuation.
- Rail-Sea-Rail (RSR) mode is also being used for coastal power plants to reduce inland congestion.



◆ Last Mile Connectivity-Merry Go Round

- Focus on captive rail infrastructure at power plants and industrial hubs.
- Ensures direct delivery of coal from railheads to consumption points without intermediate handling.
- MoC & CEA has mandated to construct MGR system upto 100kms from mines.

◆ Captive Mode Belt Conveyor System

- Power producers are investing in dedicated Belt Conveyor corridors, and loading/unloading terminals.
- This reduces dependency on public infrastructure, improves point to point delivery, and ensures dust free movement of coal.

◆ Cost and Efficiency Gains

- The new model is expected to reduce logistics costs by 14%, saving around ₹21,000 crore annually
- Enhances supply chain reliability and supports India's energy security goals.

Transformation in Coal Supply Chain

- **Policy:** Strategic Transformation from Push-Based to Pull-Based Coal Supply Chain Logistics
- **Sourcing: Commercial Coal Mining & Market Dynamics** The shift to commercial mining and market-based pricing (National Coal Index) necessitates new institutions like Coal Regulators & Coal Trade Exchange.
- **Logistics: First Mile to Last Mile Strategy-** Captive mode END TO END coal supply chain through Conveyor belts or MGR or ARR(All Route Railways).
- **Role of Railways:** Participate in FSA as transporter, Augment its Rail Infra with More Collaborations, Infuse Rolling stocks and improve upon Turnaround time.
- **Optimization Modelling:**. AI-Powered Decision Support System, Dynamic Routing & Network Optimization being way forward.
- **Technical: Coal Quality & AI/ML Deployment** Coal Quality testing & assessment are reactive and time taking, with deployment of AI/ML modelling to ascertain GCV and coal combustion optimization.
- **Sustainability:** Coal Gasification by converting coal to Syngas which being feedstock to Power Generations, Chemicals and CTL liquid fuel which can improve environment & economics of energy sector.



Thank You!



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Element	VUCA Challenge	Transformational Strategy
Volatility	Rapid, unpredictable changes (coal output, logistics, rail/road issues)	Vision: Strategic operational direction, clear stock targets, inventory build, digital platforms, automated monitoring
Uncertainty	Frequent, unpredictable events, policy and regulatory changes, weather impacts	Understanding: Proactive policy engagement, FSA compliance monitoring, weather analytics, scenario planning
Complexity	Multiple interdependent actors, fragmented systems and infrastructure deficits	Clarity: Integrated stakeholder coordination, contract standardization, digital dashboards, SOPs, streamlined processes
Ambiguity	Conflicting metrics, unclear accountability, energy transition confusion, cause-effect uncertainty	Agility: Portfolio diversification, adaptive transport strategies, rapid response systems, flexible logistics and metrics



