Economics Training Series
Introductory Course

Benefit Estimation

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Benefit Identification: The Project Framework and Economic Analysis

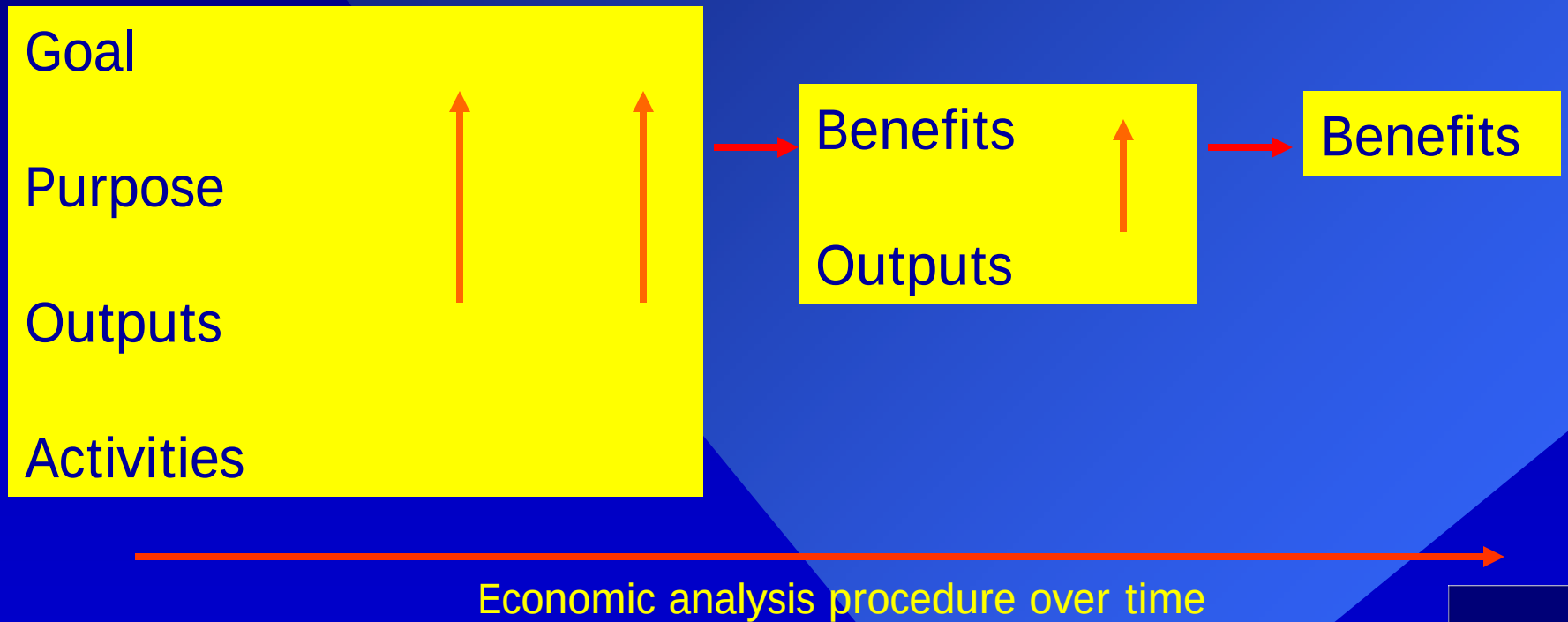
Define Targets
(from Project Framework)

Specify Outputs-to-Benefits Linkage

Value Benefits, use in EIRR calculation and distributional analysis

Target

Risks/Assumptions



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Specifying the Output-to-Benefit Linkage

Output-to-Benefit Characteristic	Characteristic	Alternate characteristic
Type of output-to-benefit linkage mechanism	Direct (e.g., the project produces intermediate or final goods for participants)	Indirect (e.g., the project strengthens institutions or services to participants)
Basis of output valuation	Project output is sold in domestic and/or international markets	Project output is not sold in markets (domestic or international)
Types of beneficiaries	Existing participants (e.g., farmers, smallholders)	New, or new and existing participants

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Benefit Identification: Incremental and Nonincremental

Economic valuation of project outputs depends upon whether they are incremental or not to existing national output or usage:

	Project Output
Incremental	the project output is additional to the case without the project
Nonincremental	the output of the project substitutes for alternative sources of supply in the economy (or imports)

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Benefit Identification: Urban Infrastructure Projects

Type of Project	Potential Nonincremental Benefits	Potential Incremental Benefits
a) Piped Water Supply	i) Alternative sources of supply displaced ii) Improved quality displacing adverse health impacts iii) Improved quality resulting in efficiency gains	Improved quality Induced demand
b) Wastewater Treatment	i) Alternative sources of wastewater treatment displaced ii) Improved health through cost of illness displacement	Induced demand

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Benefit Identification: Energy Projects

Type of Project	Potential Non-incremental Benefits	Potential Incremental Benefits
a) Power Generation	Displaced alternative forms of electricity/ energy generation in various sectors – all size generators	Additional or induced energy consumption valued at willingness-to-pay
b) Electricity Transmission i) Augmentation	i) Transmission loss reduction i) Reliability Improvement ii) Alternative supply displacement	Induced demand
ii) Interconnection	Alternative sources of fuel displaced	Induced demand

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Benefit Identification: Transportation Sector

Type of Project	Potential Non-incremental Benefits	Potential Incremental Benefits
a) Road Improvement/ Rehabilitation	i) Reduced operating costs for existing traffic ii) Reduced operating costs for traffic diverting from alternative route iii) Travel time savings iv) Reduced road maintenance expenditures	Willingness-to-pay of new traffic generated by improved conditions of road.
b) Expressway Construction	i) Resource cost savings for traffic diverting from existing roads/railways ii) Resource cost savings for traffic remaining on existing roads (reduced congestion)	Willingness-to-pay of new traffic generated by new road.

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Benefit Valuation Methodology

Non-incremental Benefits

Resource Cost Savings

Supply Price

Incremental Benefits

Willingness-to-Pay

Demand Price

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Incremental and Nonincremental Output Valuation

- incremental outputs valued at ***demand*** price (i.e., what consumers are willing to pay for them)

- nonincremental outputs valued at ***supply*** price (i.e., what it costs to produce them through the alternative means which have now been replaced/displaced)

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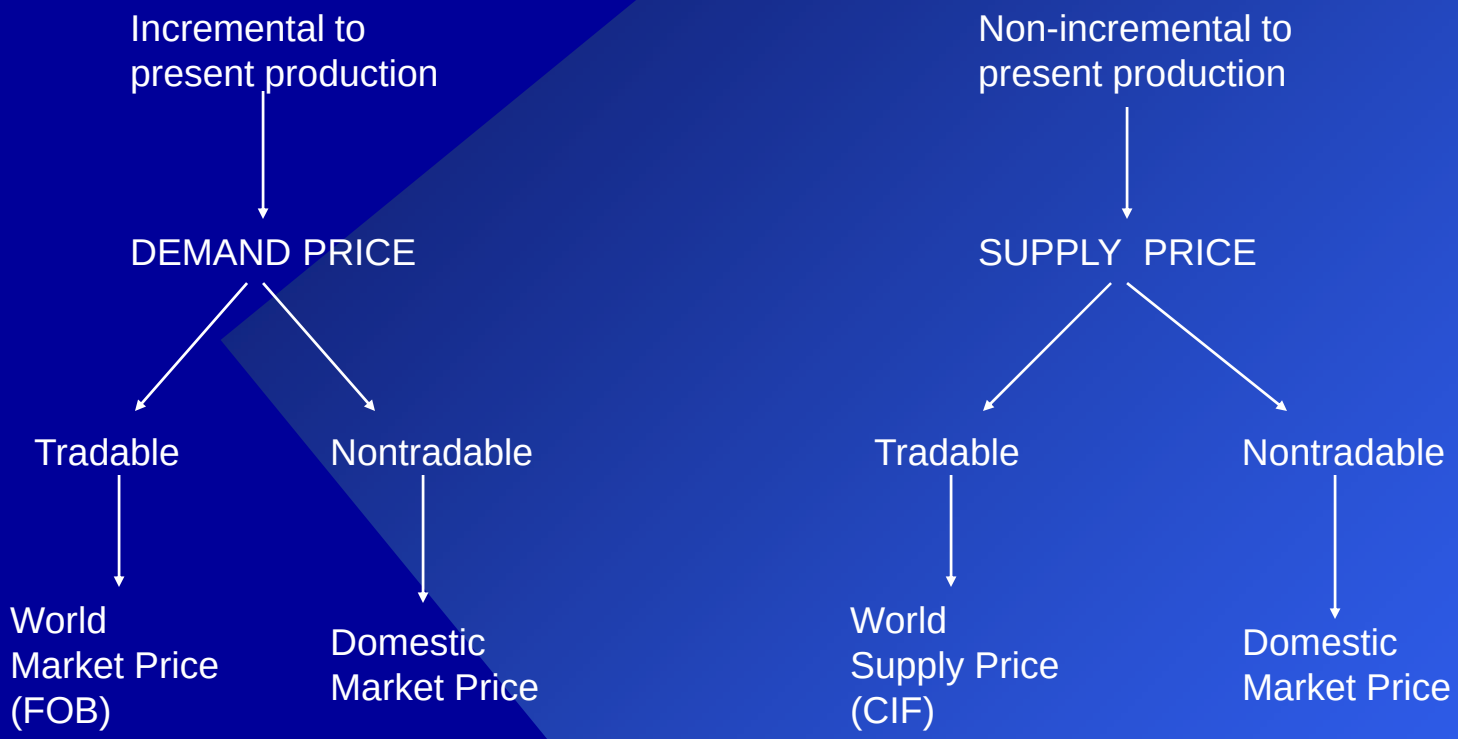
Valuing Project Outputs



NB> Note that the domestic market demand price includes net taxes (i.e., it is a measure of what consumers are willing to pay for it), but that the domestic market supply prices is only the cost of production (i.e., it should exclude any production taxes or surplus profits).

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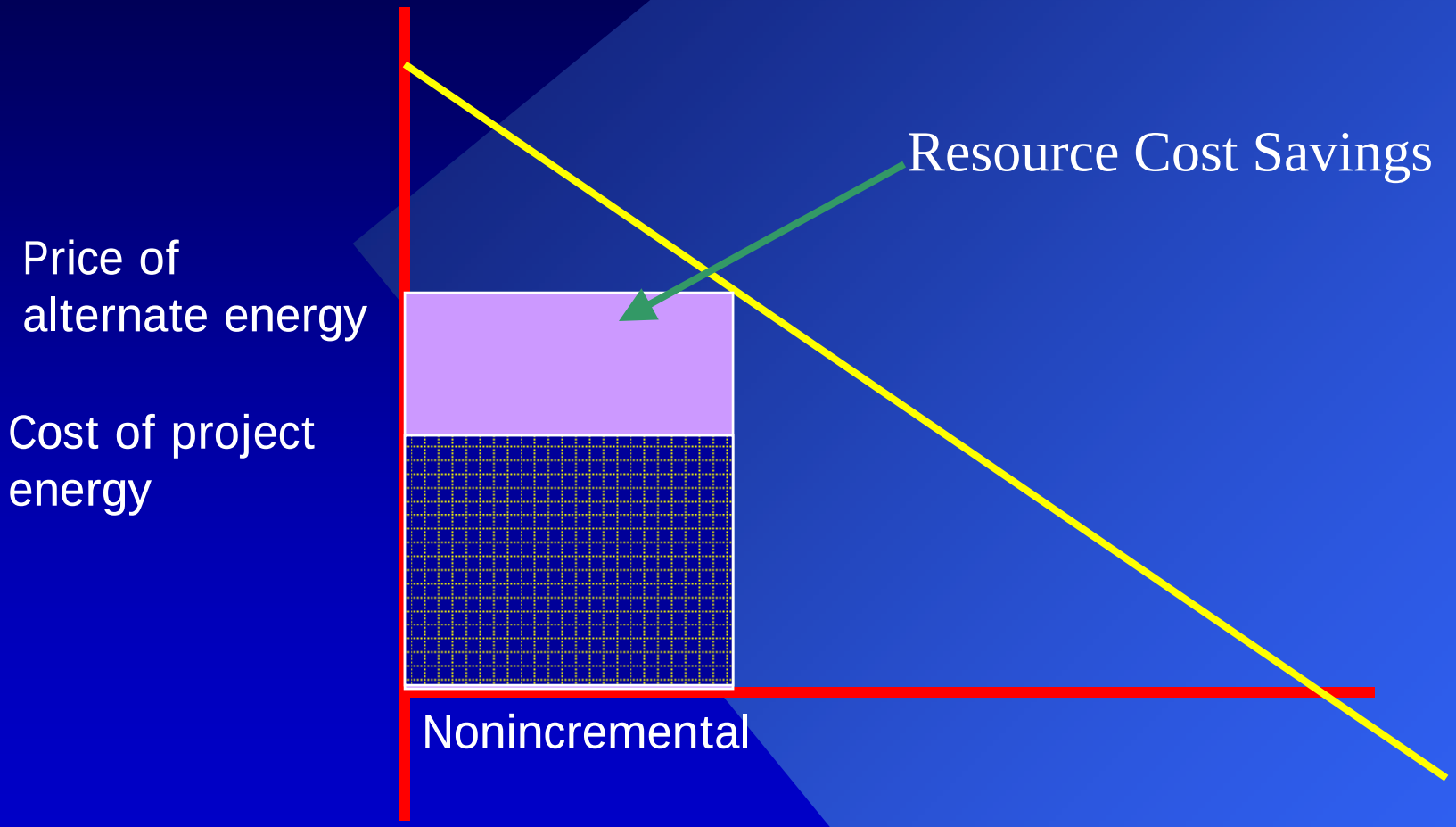
Nonincremental Benefits



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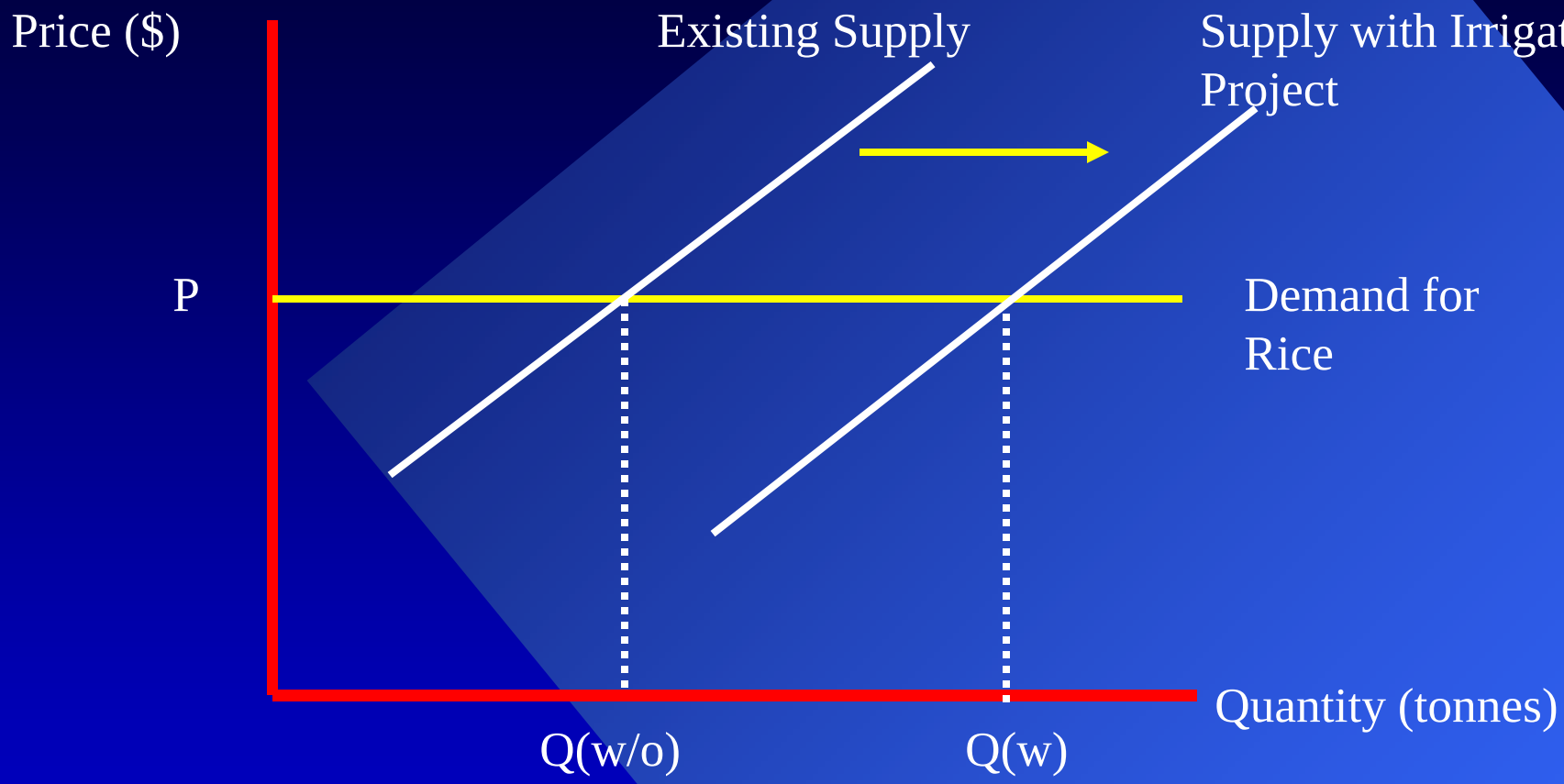
Incremental Benefits of a Tradable Output
Rice Production



The project is a new irrigation scheme.

Without the project, production is Q(w/o); price is P.

With the project, production rises to Q(w); price remains constant at P; all project output is incremental.

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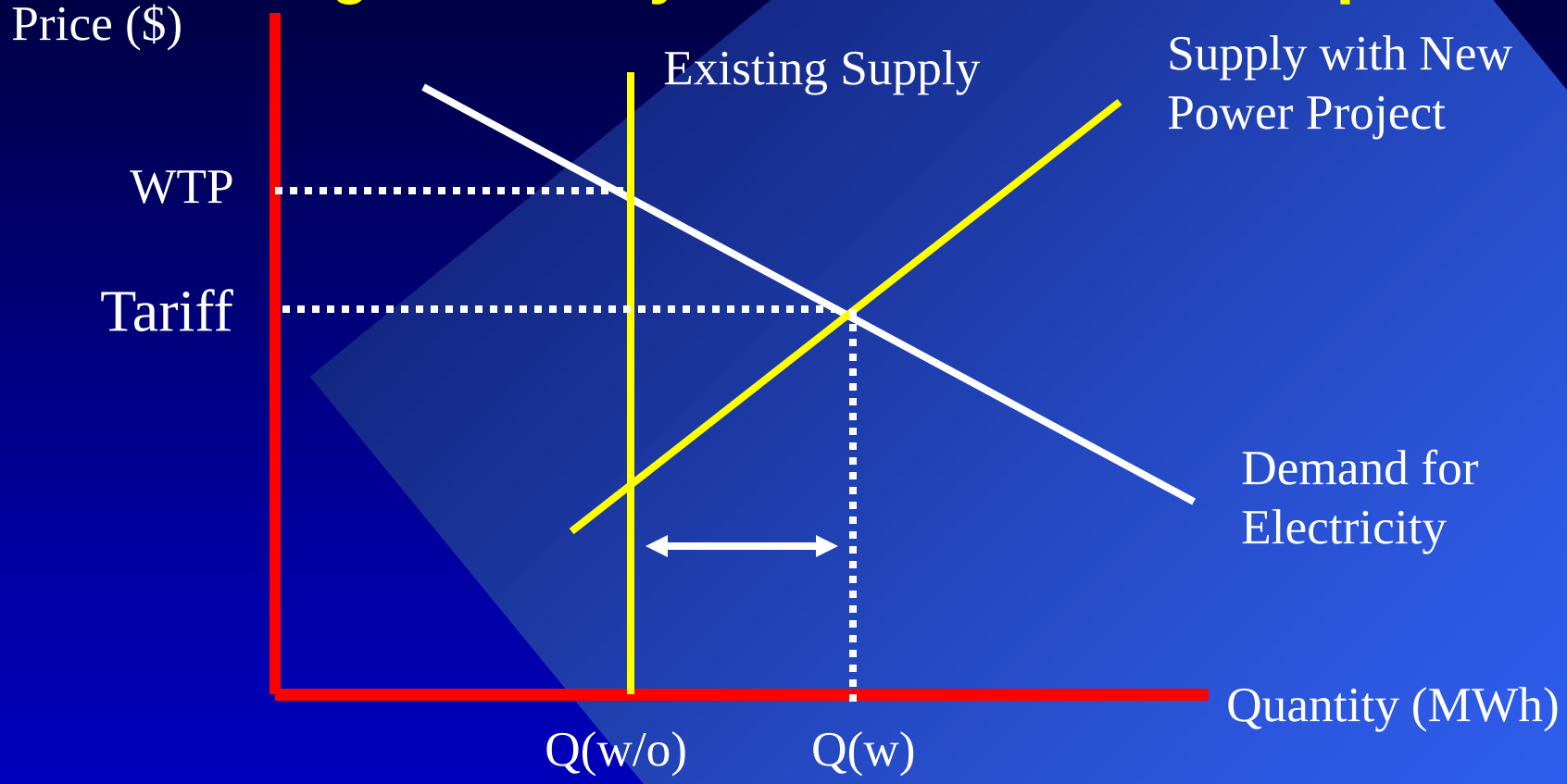
Incremental Benefits of a Nontradable Output
Producing Electricity for Domestic Consumption



The project is new power generation.

Without the project, production is Q(w/o); price is the tariff; consumers are willing to pay WTP.

With the project, production rises to Q(w); price is still the tariff.

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Valuing Nontraded Outputs

- some goods not traded internationally (policy choice; quality differences to world commodities; services cannot be traded)
- output may be incompletely marketed (e.g. domestic and irrigation water, power; prices set as tariffs, user charges)
- outputs may be entirely non-marketed ('public goods'; e.g. soil conservation, reduced waste pollution)
- new supply from project may be significant in domestic terms and may result in price fall
- value to existing and new consumers must be estimated (incremental / nonincremental applies)
- where no charges are made for goods or services (e.g. rural water, environmental improvements) - contingent valuation, hedonic pricing, travel cost method (TCM), benefits transfer can be applied

Non-Quantifiable Economic Benefits

- non-tangible (social / political, knowledge / information / business skills)
- tangible (inputs for processing industry, new businesses)
- exclude from economic analysis but describe textually (quantity and quality)

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Benefit Shadow Pricing

	Adjustment	
Numeraire	Nontradable	Tradable
Domestic Price	none	SERF
Border Price	SCF	none

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Steps for Applying Economic Pricing - 1

Step	Task	Issue or Choice	Data/Information Sources
1	Collate and summarize national parameters (SERF/SCF; SWRF; EOCC) to extent they exist	Who calculated these, and how recently? How recently were the parameters derived? Does the sector/ economy have an opportunity cost of capital different from ADB's standard 12% estimate?	National planning or finance ministry reports/data; ADB reports of recent projects in the economy; other multilateral agency publications or reports maintaining conversion factors; national balance of payment accounts
2	Decide on numeraire for economic analysis calculations (i.e., domestic or world prices)	How small and open is the economy? Which basis will make for easier financial/ economic comparison?	National accounts; assumes SERF/SCF have already been derived What does national agency use as its standards?
3	Decide on base year to use for current prices	Use year in which analysis is being undertaken	Manufactured Unit Value index predicts real price trends, net of price level changes
4	Make preliminary financial cost estimate and decide if any project inputs need specific conversion factors calculated	What proportion of project costs does this input account for? Will it be sufficient just to 'sensitivity test' for this item?	Cost composition of specific items

Steps for Applying Economic Pricing - 2

Step	Task	Issue or Choice	Data/Information Sources
5	Decide whether a project-specific shadow wage rate for unskilled labor (or even for scarce labor) needs to be calculated	How important is surplus labor to total project costs? Is the cost of labor expected to change over time? Will it be sufficient to 'sensitivity test' for the labor costs?	Labor costs as a proportion of sub-project and project costs; estimates of agricultural output foregone; local wage rates (protected and unprotected) by category of labor; annual urban incomes; unemployment rates; wage and income forecasts
6	Summarize major inputs and outputs according to whether they are incremental or non-incremental	Inputs and outputs may both be incremental and non-incremental in their use/effect; in this case a weighted average of prices will be necessary	Outputs as a proportion of domestic and world volumes
7	Identify appropriate demand and supply border prices for traded items, and domestic prices for non-tradable items	Use real long-term commodity price projections, not current price from one year. If price outcomes are different, post-evaluation work will capture effects	World Bank publications
8	Adjust border prices to project site equivalent		Disaggregated estimates of processing, transport, distribution and handling costs