



Technical Training in Project Appraisal for the Lower Mekong Basin

VALUATION OF PROJECT ECONOMIC BENEFITS

*Ho Chi Minh City
Nov 28 - Dec 09, 2016*

Basis of Output Benefit Valuation

- ◆ Project output is tradable
 - ✓ Using world prices as a basis for economic prices
 - ✓ Adjust for domestic handling and transport charges

- ◆ Project output is non-tradable
 - ✓ Using domestic supply and demand, and market prices as a basis with adjustment of taxes/subsidies (market distortions)

- ◆ Project output is not sold in markets
 - ✓ Willingness-to-pay survey (demand price)
 - ✓ Resource cost estimation (supply price) if project results in cost savings

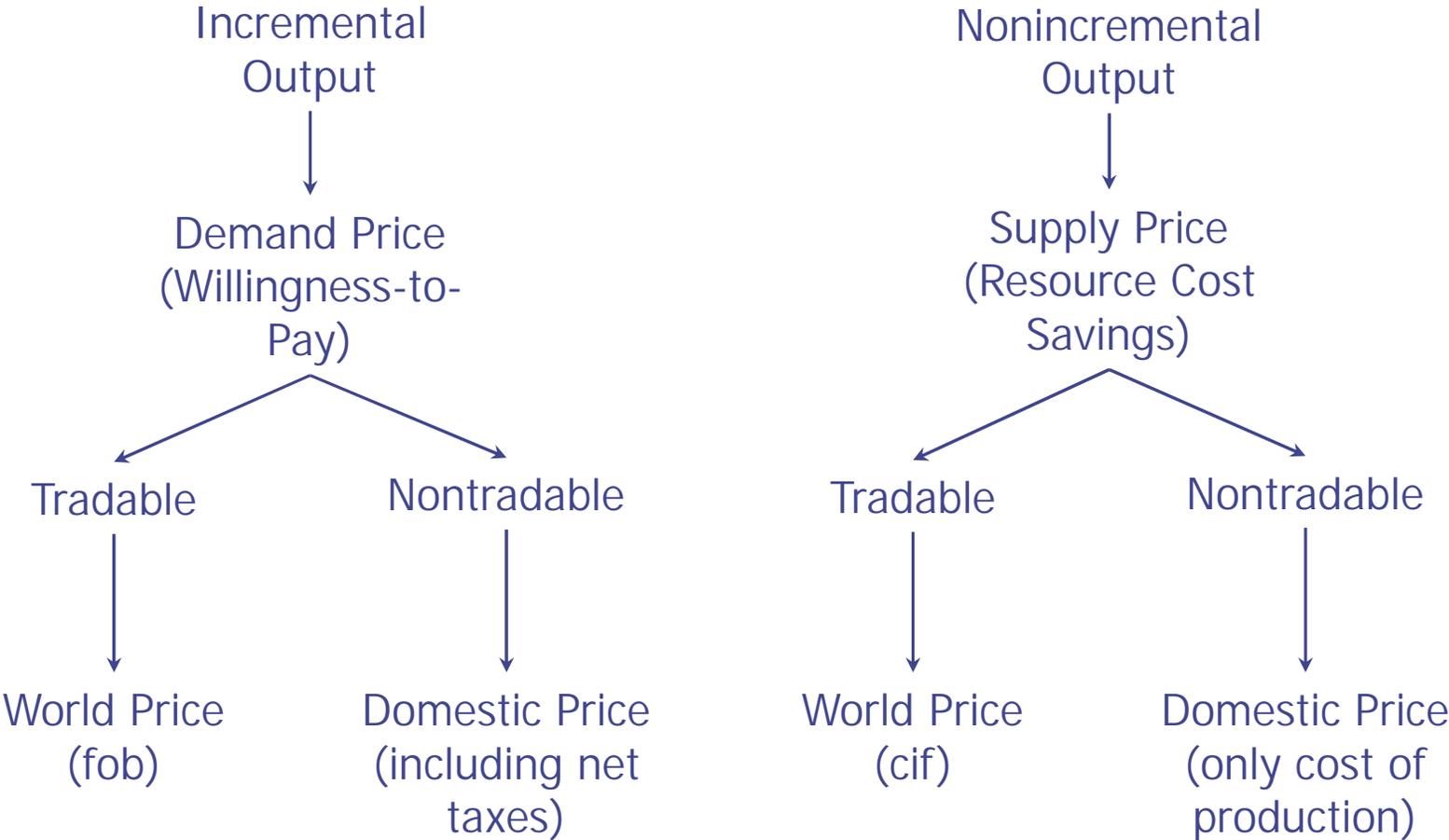
Benefit Identification: Incremental vs. Nonincremental

Incremental	Project output is additional to the case without project
Nonincremental	Project output substitutes for the alternative sources of supply

Examples of Incremental and Nonincremental Economic Benefits

	Incremental benefits	Nonincremental benefits
Water supply	Lower price and improved quality induce more consumption	Water supplied from wells is replaced by piped supply
Electricity generation	Lower price and improved stability induce more consumption	Electricity from private generators is replaced
Transport	Lower time and vehicle operating costs induce more traffic	Reduced time and vehicle operating costs for existing traffic

Framework



Financial and Economic Prices of Tradables

◆ Exports:

- ✓ Financial Price = World Price (fob) - Export tax
- ✓ Economic Price = World Price (fob)

◆ Imports:

- ✓ Financial Price = World Price (cif) + Import tax
- ✓ Economic Price = World Price (cif)

- ◆ If domestic handling and transport costs to or from project site are significant (in making domestic prices different from world price), they need to be adjusted in the financial-to-economic price conversion as well.

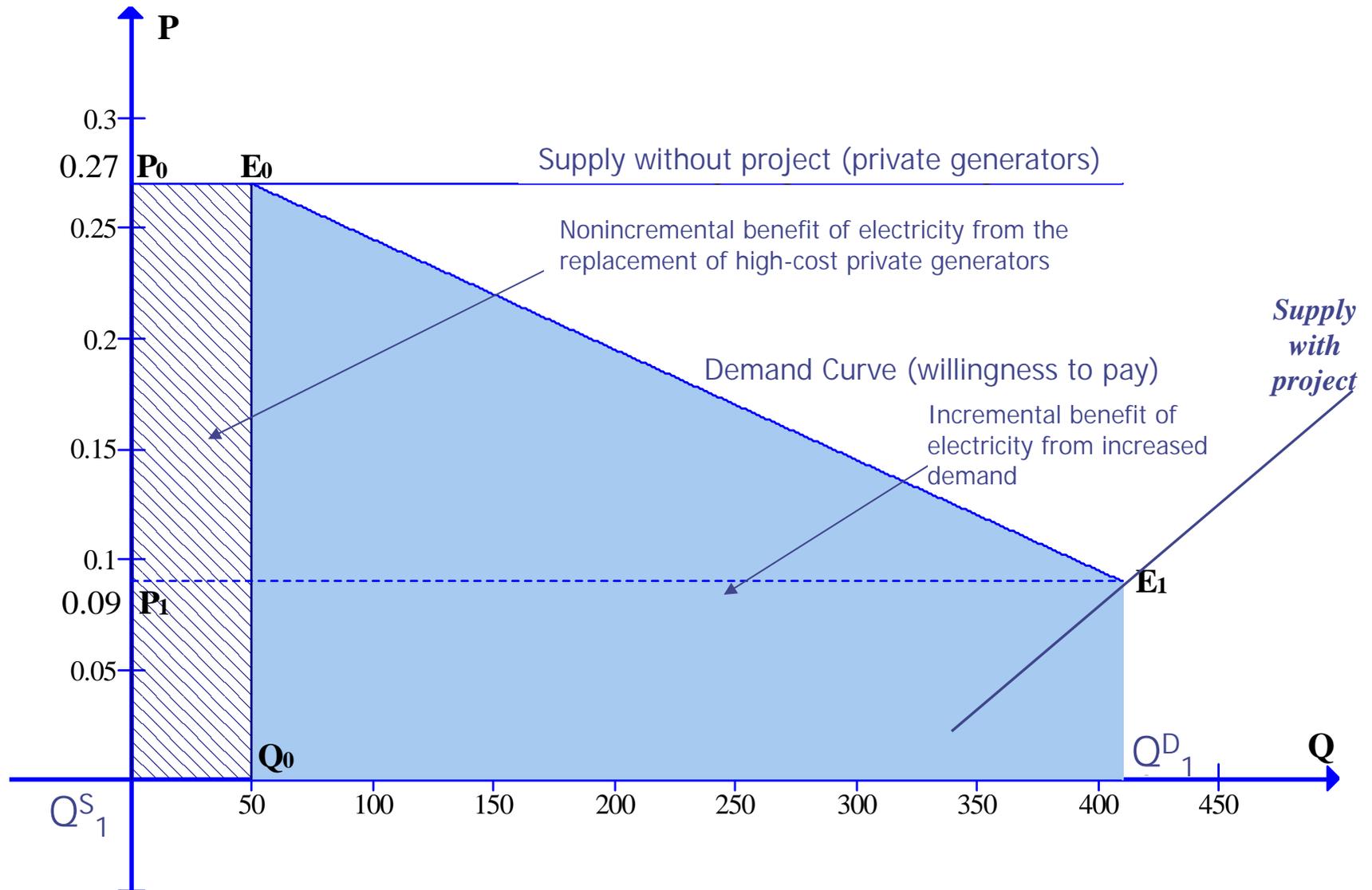
Example 1: Tate and Lyle Sugar Project

- ◆ Project output: sugar
 - ✓ Tradable
 - ✓ Nonincremental (import substitution)
- ◆ World price of sugar (cif) in 1999
 - ✓ $P^W = 300$ (\$/ton)
- ◆ Import tariff
 - ✓ $t = 30\%$
- ◆ Financial price of sugar (financial benefit to the project investors)
 - ✓ $PF = P^W(1 + t) = 390$
- ◆ Economic price of sugar (economic benefit to society)
 - ✓ $P^E = P^W = 300$

Example 2: DPE Project

- ◆ Project output: electricity
 - ✓ Nontradable
 - ✓ Both incremental and nonincremental
- ◆ Final users: households in the Mekong Delta
- ◆ Nonincremental output of electricity
 - ✓ Electricity supplied by the project will replace electricity supplied by private generators
- ◆ Incremental output of electricity
 - ✓ Increased consumption by households due to lower cost of electricity
- ◆ Financial prices of electricity
 - ✓ Price of electricity for residential use (supplied by EVN), inclusive of VAT: 9 cent/kWh
 - ✓ Cost of electricity supplied by private generators: 27 cent/kWh

Economic Benefits of Electricity



Estimation of Economic Benefits of Electricity

◆ Project Impact:

- ✓ *Nonincremental*: With the project, households switch from private generators to DPE electricity. The entire existing consumption of 50 kWh per month will be substituted. The resource cost savings is 0.27 \$/kWh.
- ✓ *Incremental* : At 0.09 USD/kWh, households will increase their average consumption to 410 kWh per month. The increased consumption is:

$$\Delta Q^D = Q^D_1 - Q_0 = 410 - 50 = 360 \text{ kWh}$$

◆ The total economic benefits are measured by the area of $Q^S_1 P_0 E_0 E_1 Q^D_1$:

- ✓ Incremental benefit = Area $E_0 E_1 Q^D_1 Q_0$.
- ✓ Nonincremental benefit = Area $P_0 E_0 Q_0 Q^S_1$.

Valuation of Economic Benefits of Electricity

- ◆ Economic benefit of increased consumption:
 - ✓ Area $E_0E_1Q^D_1Q_0$
 $= (0.09 + 0.27) * (410 - 50) / 2 = 64.8$ (US\$)
- ◆ Economic benefit of resource cost savings:
 - ✓ Area $P_0E_0Q_0Q^S_1$
 $= 0.27 * 50 = 13.5$ (US\$)
- ◆ Total benefits
 - ✓ Area $Q^S_1 P_0E_0E_1Q^D_1$
 $= 64.8 + 13.5 = 78.3$ (US\$)
- ◆ Economic price of electricity
 - = Total benefits/Total amount of electricity consumed
 - = $78.3 / 410 = 0.191$ (US\$/kWh)