

EE303 — Energy Systems and Power Electronics

Lecture 25. Economic dispatch

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Today's objectives

- **FORMULATE** the economic dispatch problem as a constrained optimization problem
- **SOLVE** the economic dispatch problem using Lagrangian multipliers
- **SOLVE** the economic dispatch problem using the Karush–Kuhn–Tucker (KKT) conditions



Joseph-Louis Lagrange, born Giuseppe Lodovico Lagrangia
(January 25, 1736–April 10, 1813)

Example \sim E3.3, p. 136

	Unit 1	Unit 2
Generation specs.		
Minimum generation	200 MW	100 MW
Maximum generation	380 MW	200 MW
Cost curve coeffs.		
quadratic term	0.016	0.019
linear term	2	2.4
constant term	120	74

For this two-unit example, assume that the total power that needs to be generated is $P_T = 400$ MW. Compute the optimal economic dispatch.

Example \sim E3.5, p. 138

	Unit 1	Unit 2
Generation specs.		
Minimum generation	200 MW	100 MW
Maximum generation	380 MW	200 MW
Cost curve coeffs.		
quadratic term	0.016	0.019
linear term	2	2.4
constant term	120	74

For this two-unit example, assume that the total power that needs to be generated is $P_T = 500$ MW. Compute the optimal economic dispatch.

Reading material

The material we covered today corresponds to:

- Module E3, pp. 122–146 of the class notes