

**Exercices du chapitre 2 (cf. note de cours)**

**4.2** The input-output curve of a gas-fired generating unit is approximated by the following function:

$$H(P) = 120 + 9.3P + 0.0025P^2 \text{ [MBtu/h]}$$

$$1 \text{ Btu} = 1055.055 \text{ J}$$

This unit has a minimum stable generation of 200 MW and a maximum output of 500 MW. The cost of gas is 1.20 \$/MBtu. Over a six-hour period, the output of this unit is sold on a market for electrical energy at the prices shown in the table below.

Period	1	2	3	4	5	6
Price[\$/MWh]	12.5	10	13	13.5	15	11

Assuming that this unit is optimally dispatched, is initially on-line and cannot be shut down, calculate its operational profit or loss for this period.

**4.4** Assume that the unit of Problem 4.2 has a start-up cost of \$500 and that it is initially shutdown. Given the same prices as in problem 4.2, when should this unit be brought on-line and when should it be shutdown to maximize its operational profit? Assume that dynamic constraints do not affect the optimal dispatch of this generating unit.

**4.5** Repeat Problem 4.4 taking into account that the minimum up-time of this unit is four hours.