IN5410 "Energy Informatics"
oral exam information

Exam and Grades

- **Grading based on a weighted combination of**

  - ## Oral examination (70%)

  - ## Project assignment 1 (15%)

  - ## Project assignment 2 (15%)

- **Examination**

  - ## Oral examination

Date & Room

- **Date: 3-4 June 2019**

- **Room: announce later**

- **If you prefer to one of these days or language, please let me know as early as possible. You can choose**
  - **3 June or 4 June**
  - **Morning or afternoon**
  - **Norwegian or English**

- **We will send out the timeslot arrangement two weeks before the oral exam.**

Oral Exam

- **We have two groups on either day.**
  - **Group A: Yan Zhang + a censor (tbd)**
  - **Group B: Frank Eliassen + a censor (UiO)**

- **4 different sets of questions. Each set of questions has about 6-8 questions.**

- **Step 0: Each student meets at a given time at the preparation room.**

- **Step 1: By drawing a ticket you will be assigned one set of questions.**

- **Step 2: Each student has 30min to prepare answers to these questions. Then, Frank Eliassen or Yan Zhang will fetch you to go to the examination room.**

- **Step 3: In the examination room, we have 30min for oral exam. We will go through questions one-by-one.**

- **Note: we will decide the grade after all students have finished the exam, most probably the afternoon of 4 June.**

Materials and Questions

- **Materials: the teaching material. Not guest lecture material**

- **Questions:**

  - **General questions, e.g.,** what is demand response and its approaches? What is tamper-proof mechanism in blockchain? What is replay attack in smart grid and how to defend?

  - **Calculation questions, e.g.,** calculate to get Nash equilibrium

AN EXAMPLE OF CALCULATION QUESTION

Calculation question in Spring 2017

- **Please explain the game and Nash equilibrium in two energy operators. Please explain on how to choose the power production level (either High or Low production) that maximizes their profits.**

- In Oslo, there are two operators: Operator A and Operator B. Both operators have the same power generation cost 10NOK/MWh. Operator A chooses only between two levels of production: High production with 75MW and Low production with 20MW. Operator B chooses only between two levels of production: High production with 50MW and Low production with 10MW. The price-production curve is given in the right-side.
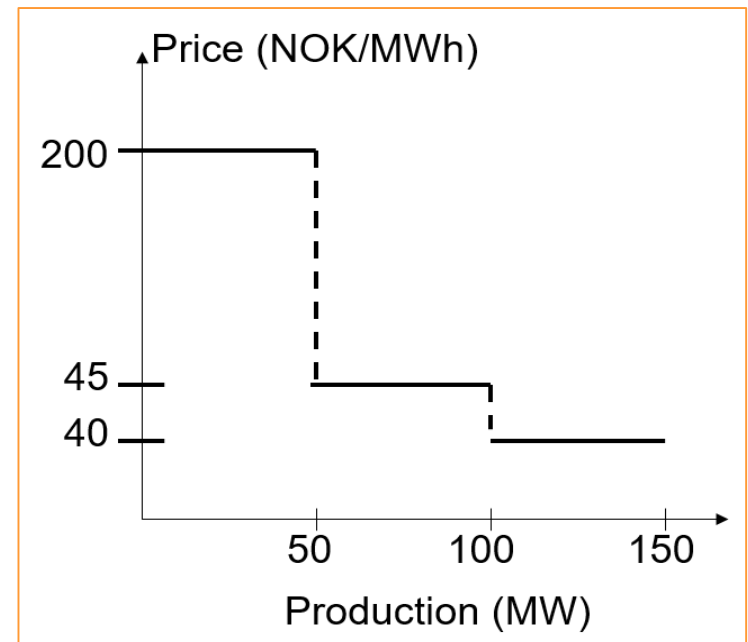
You need to refer to the lecture on "Energy Market and Game Theory"

PRODUCTION	Generator B	
Generator A	High	Low
High	(75, 50)	(75, 10)
Low	(20, 50)	(20, 10)

Price	Generator B	
Generator A	High	Low
High	40	45
Low	45	200

Profit	Generator B	
Generator A	High	Low
High	(2250, 1500)	(2625, 350)
Low	(700, 1750)	(3800, 1900)

- **Nash equilibrium: (low, low) and the profit is: (3800, 1900)**