

GASCOM, INC.

Note: This case is written from the point of view of 2005.

Gascom Inc. has decided to develop an already well-defined offshore gas field. The gas contains carbon dioxide (CO₂) that must be separated before the natural gas is used. The gas production profile has already been well determined by facilities choices, and the CO₂ to gas ratio is also well known. Therefore the uncertainty in the CO₂ production profile is small enough to ignore. Gascom is considering how to deal with the possibility of the imposition of a price on CO₂ emissions in the future.

At some point, it can build a carbon capture and storage (CCS) plant into the production facility, which will compress the CO₂ and pipe it to an otherwise useless underground reservoir for injection. Once gas production begins, the CO₂ must be emitted to the atmosphere unless or until this CCS plant is built.

If the CCS plant is built, natural gas from the field will be used as the energy source for the compression, transport and injection of the CO₂. There are two possible injection schemes that involve a tradeoff between injection drilling costs and the amount of energy required for injection. Moreover, some uncertainty about the geology of the injection reservoir means that there is some uncertainty, for any given injection scheme, in the amount of gas that will be needed to provide energy for injection. The asset team has estimated a probability distribution of this based on some prior knowledge of the reservoir and the behavior of similar reservoirs that have been used for this purpose.

elsewhere. This uncertainty can be resolved by a costly reservoir test. Otherwise it will be resolved once large scale injection is begun. Moreover, if the reservoir test is done, the increased knowledge of the reservoir will allow a refinement of the design of the injection scheme that will lower the energy costs.

If the CCS plant is in place Gascom can decide annually whether to use it or not. (It can also approximate the cash-flows to occur annually). There is a maintenance cost while the plant is not being used but no transition costs for turning it on or off. If it is not used, the CO₂ will be emitted to the atmosphere.

Gascom has an immediate decision to make.

- 1) It can build space into the production facility for the CCS plant.
- 2) It can do nothing now about CCS. If Gascom then decides to build the sequestration plant later, this will mean a retrofit of the facilities that will be more costly than setting aside the space now.

The technology for sequestration is well enough known so that the cost of building the sequestration plant in the future (including any possible retrofit) will depend only on the commercial environment at the time and the injection scheme selected.