

## Uranium and nuclear power: facts and figures

Basic information about uranium, radioactivity and the uranium fuel cycle

### What is uranium?

Uranium is a naturally-occurring radioactive element.

Uranium ore is mined in open-cut or underground operations, or through liquid recovery (fact sheet 5).

Uranium ore is processed into concentrated uranium oxide ( $U_3O_8$ ), also known as yellowcake.

Yellowcake is chemically and physically stable, and can be exported safely.

### What is radiation?

Radiation is particles or electromagnetic waves (like x-rays) that have the ability to interact with different kinds of matter.

Uranium is known as a radioactive material because it naturally breaks down and in the process release radiation. Uranium breakdown also releases the radioactive gas radon.

Other radioactive materials include thorium, radon and a form of potassium. The latter is naturally occurring in our bodies making humans also measurably radioactive.

### How is radiation exposure measured?

The unit for measuring radiation exposure is the Sievert, often used in the form of the milliSievert (mSv).

At high to very high radiation exposure levels (100-10,000 mSv) serious health problems and death result. At low exposure (10-20mSv and below), no discernible effects are observed.

Australians are exposed to around 3mSv of radiation per year through normal life.

### What is the uranium fuel cycle?

All of the required steps to convert mined uranium into a form suitable for making electricity comprise the uranium fuel cycle. To complete the fuel cycle, including the use of the reactor in the final storage of the used fuel must also be included.

Some of the main steps in the uranium fuel cycle are mining and milling, conversion, enrichment, fuel fabrication and production of electricity. In this cycle, only mining, milling and processing currently take place in Australia (see Figure below).



**Steps in the uranium fuel cycle. Those occurring in Australia are indicated.**