



# The Importance of Uranium Mining:

*What's all the fuss about?*

WA School of Mines  
Graduates Association  
10 April 2014

**Australia's  
Leading  
Development  
Stage Uranium  
Company**

# The Importance of Uranium Mining: what's all the fuss about?



- Mythbusters: 5 things you should know about uranium
- Why uranium.....why Australia.....why WA?
- Wiluna Uranium Project
- Uranium and WASM

# Myth Busting



# Mythbusters:



## 5 Things to know about Uranium

1. Is Uranium safe?
2. What can Uranium be used for?
3. How is it controlled?
4. What are the benefits?
5. Why should WA have a Uranium mine?

# Is Uranium safe?

- Heaviest naturally occurring metal
- Only mildly radioactive in natural form
- 3 isotopic forms –  $U^{238}$   $U^{235}$   $U^{234}$
- Uranium ore =
  - $U^{238} = 99.3\%$
  - $U^{235} = 0.7\%$  (fissile)
- To convert U ore to nuclear fuel requires multiple processing steps
- 1 kg  $U_3O_8 = 20,000$  t black coal
- Sufficient energy to power an average household for 25 years

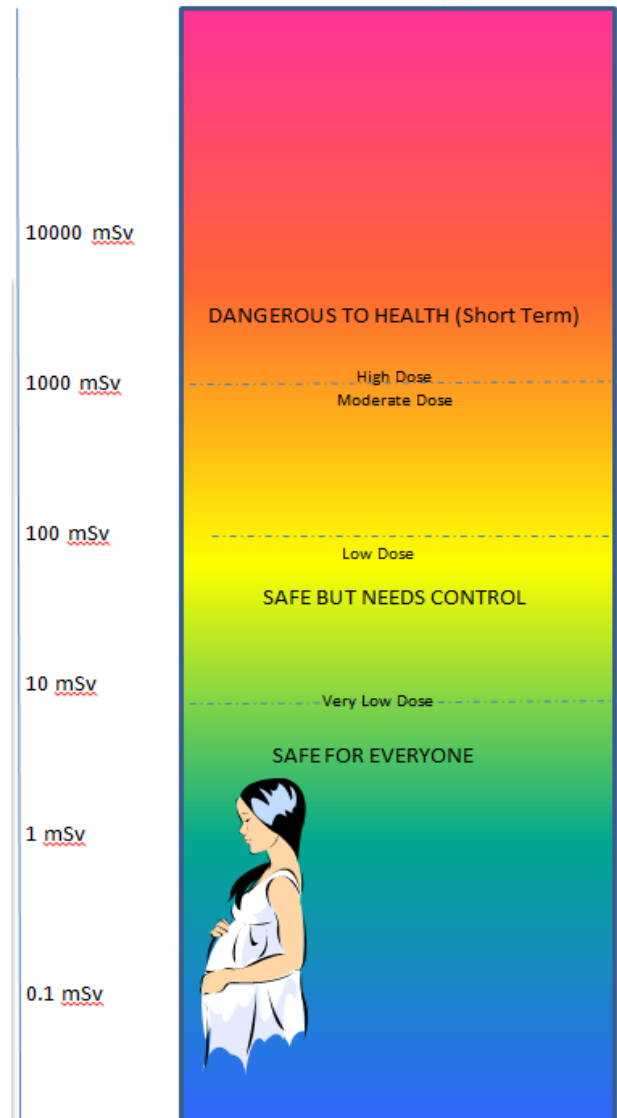
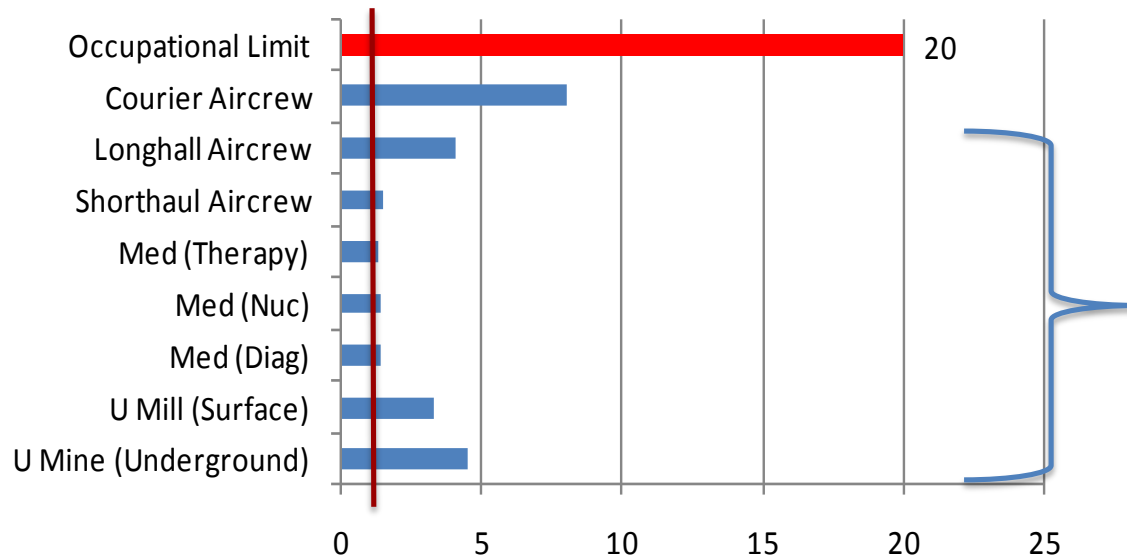


# Is Uranium safe?

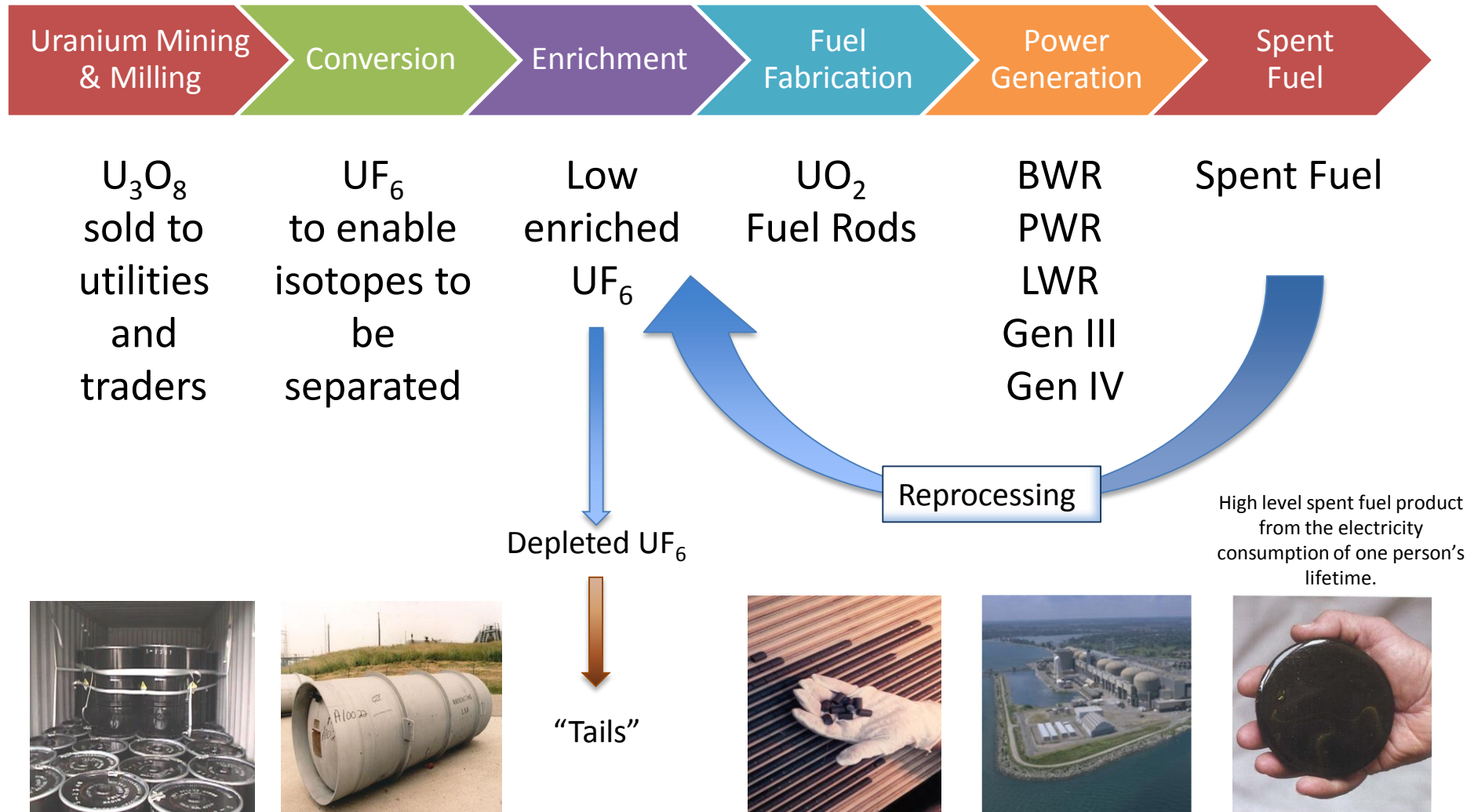
Everyone is exposed to background radiation all the time:

- Rocks, soils, food, air
- Medical imaging
- Even flying!

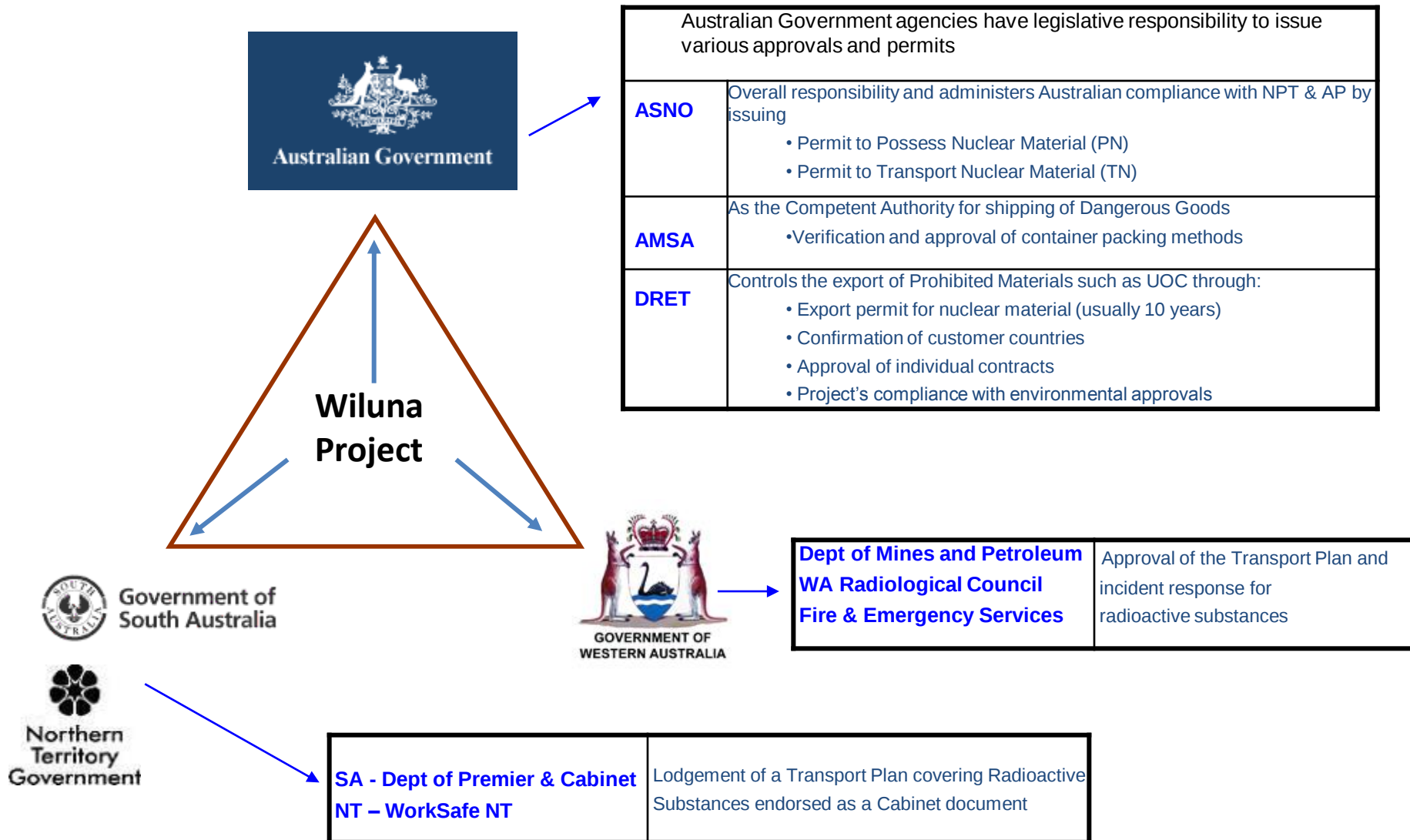
## Annual Average Dose (mSv)



# What can uranium be used for?

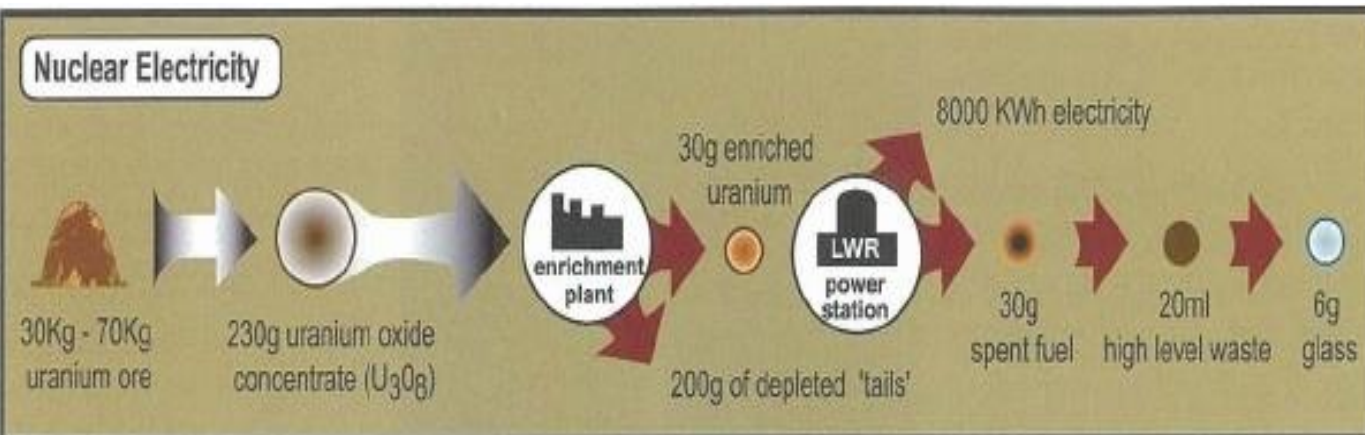


# How is it controlled?



# What are the benefits?

Coal produces more than 1 million times the waste (by weight of final product).

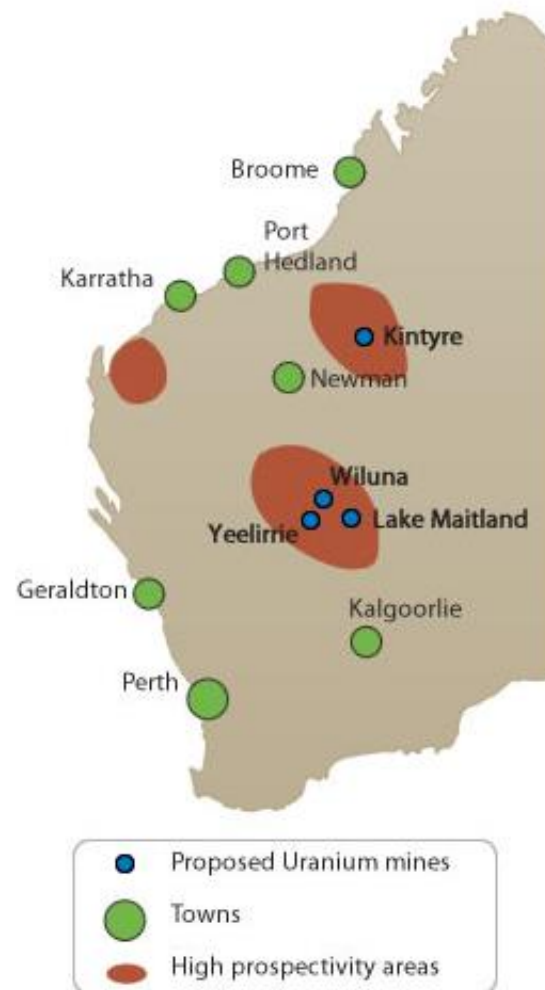
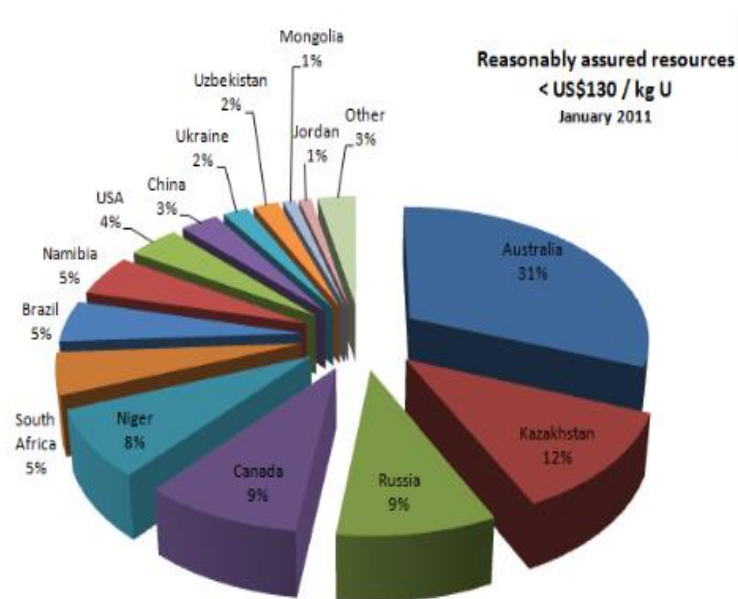


High level spent fuel product from the electricity consumption of one person's lifetime would be encapsulated in a vitrified glass disc of this size.

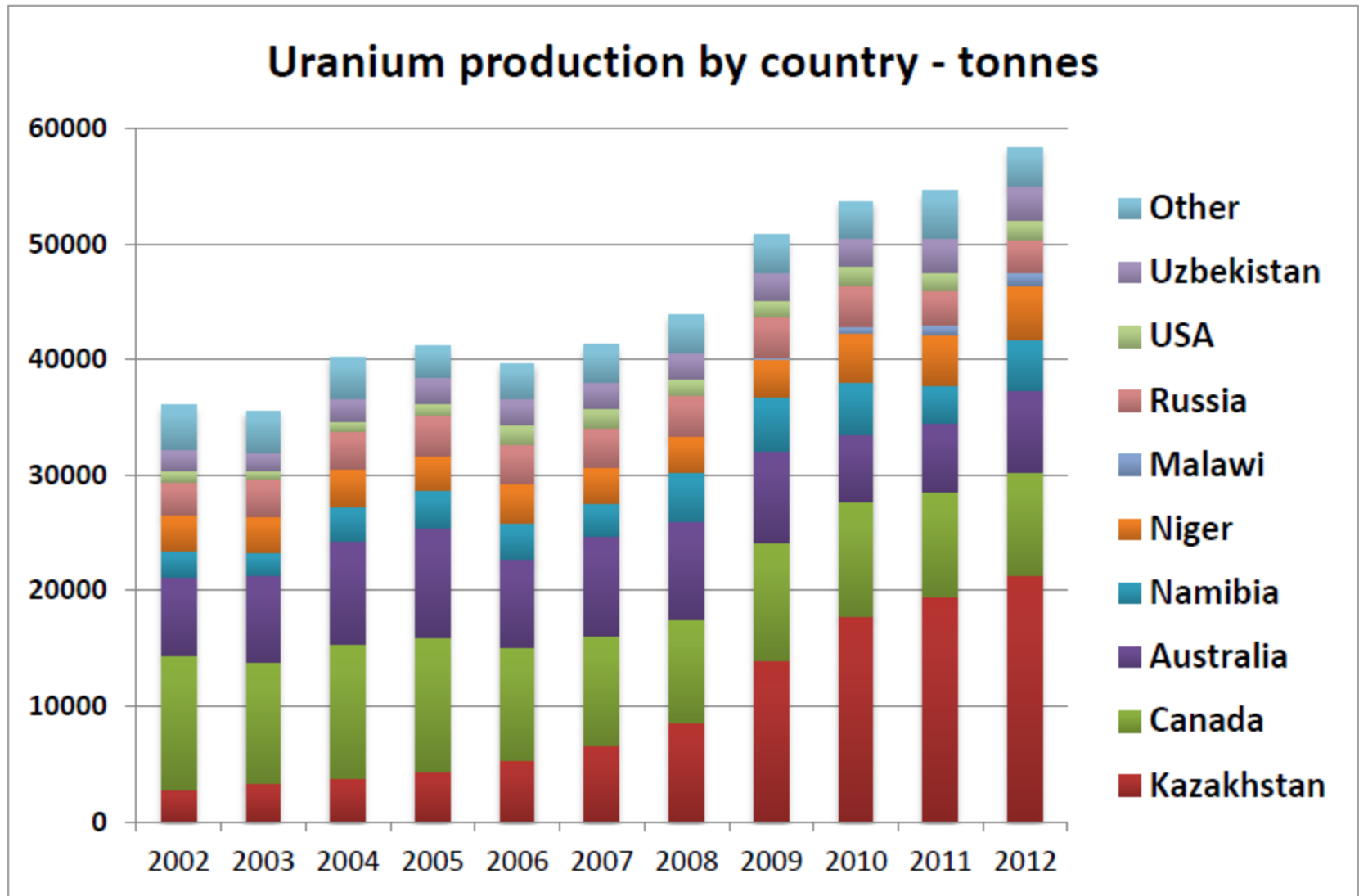
# Why should WA have a Uranium mine?



- ✓ Australia has over 30% of the world's uranium resources but supplies under 12% of world supply
- ✓ 28% of world population consumes 77% world energy production
- ✓ WA has abundant resources that could help counter climate change effects when combined with renewables



# Global Uranium Production

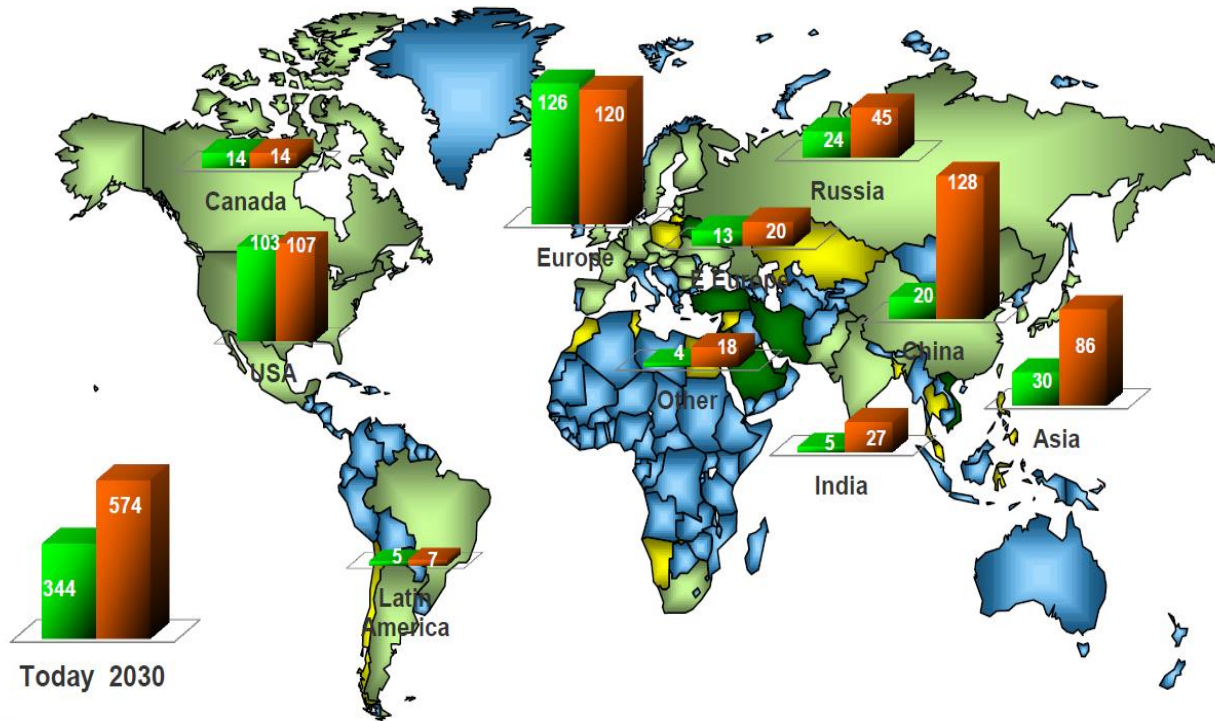


# Global Uranium Demand

## Reference Case Capacity

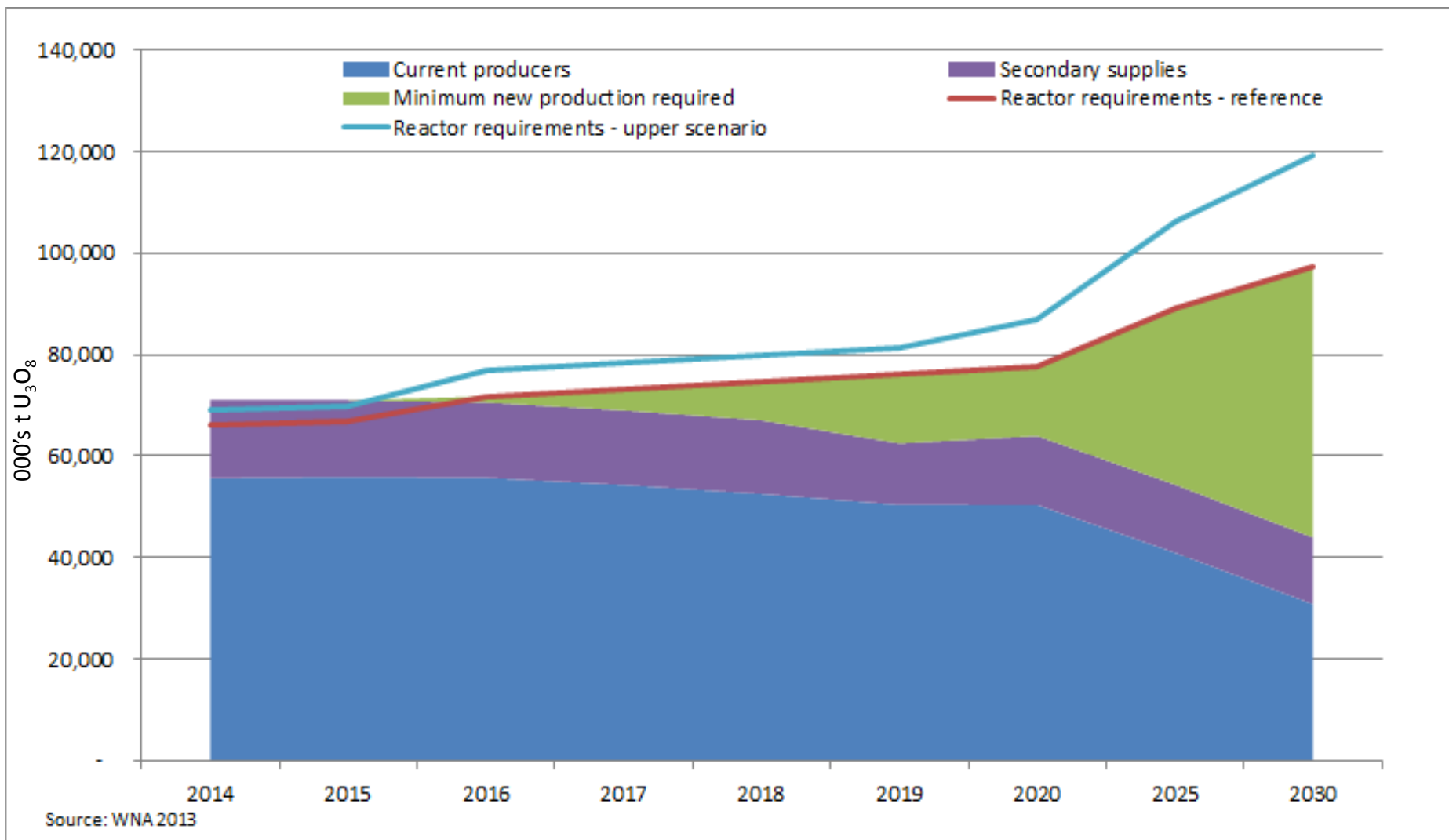
Net GWe (2013 to 2030)

operating serious emerging



|   |             | 2013 | 2030 |
|---|-------------|------|------|
| ✗ | US & Canada | 117  | 121  |
| ✗ | Europe      | 126  | 120  |
| ✓ | Russia      | 24   | 45   |
| ✓ | China       | 20   | 128  |
| ✓ | India       | 5    | 27   |
| ✓ | Asia        | 30   | 86   |
| ✓ | Middle East | 4    | 18   |

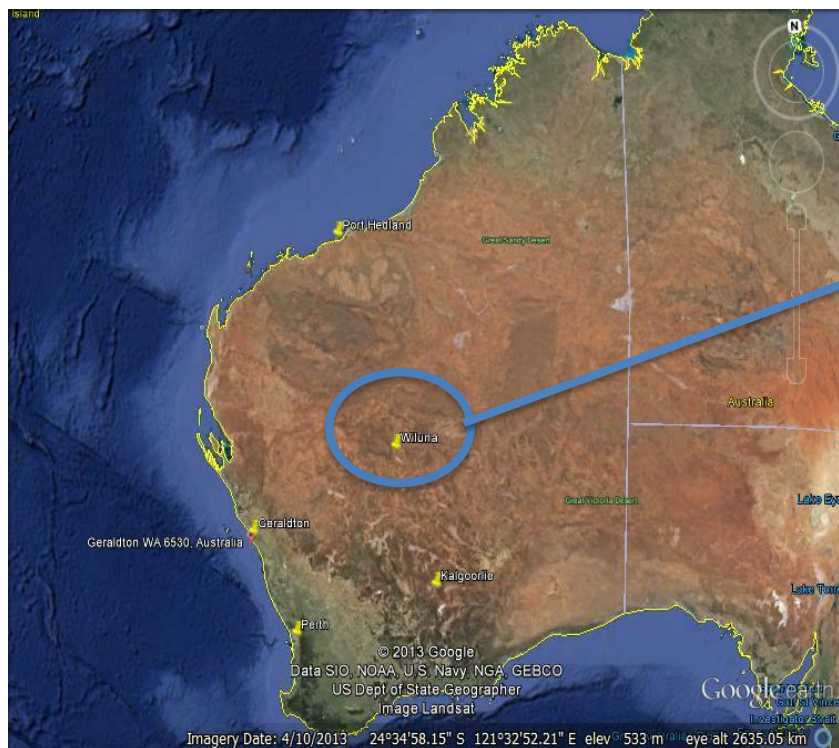
# Supply/Demand Forecast



# Wiluna Uranium Mine



The town of Wiluna has supported mining for over 100 years



- Wiluna is located ~950km north-west of Perth
- Commercial aircraft fly regularly
- Access by sealed highways
- 6 surficial deposits calcrete-hosted carnotite mineralisation
- Carbonate leach process, \$315M capex
- 1.3Mtpa throughput, 2 mlb per annum production
- 350 construction 170 operations employees
- Up to 25 year mine life

# Core Farm at Wiluna



# What research is needed to support the emerging industry?



## ➤ Geology:

- new technologies to look beneath regolith
- new technologies to determine grade control

## ➤ Processing:

- beneficiation technologies for distant deposits
- improvement in recovery/efficiency for carbonate leach

## ➤ Environmental:

- improved understanding of rehabilitation in harsh arid/semi-arid climates
- Rehabilitation of overgrazed semi-arid country
- *Tecticornia* spp research

# Graduates?

- Mining
- Engineering – chemical, metallurgy, process
- Geology
- Environment
- Radiation
- Accounts, finance, markets, community etc



# Nuclear power in Australia? In WA?



## ❌ Barriers to Entry:

- Well established national market
- Small population base
- Low energy-intensive manufacturing base
- High capital cost for nuclear new build

## ✅ Opportunities for Entry:

- Significant resources available for domestic use
- Small Modular Reactors design

# The Importance of Uranium



## URANIUM ~ what's all the fuss?

- ✓ **SAFE** – Yes
- ✓ **USED** for Power
- ✓ **CONTROLLED** by national and international regulators
- ✓ **BENEFITS** – Clean Energy
- ✓ **WHY WA** – close to market, large resource base

# The Importance of Uranium



## WHY WA and Wiluna?

- ✓ Close to growing markets
- ✓ Approved, ready to meet emerging supply gap
- ✓ Independent, uncontracted uranium supply
- ✓ Mining friendly jurisdiction, Wiluna = zero emission site
- ✓ New industry capable of creating new jobs

# Contact



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