

# **Eagle Rock Enrichment Facility Mandatory Hearing**

## **ASLB Presentation Topic #1 Purpose and Need for Proposed Action**

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# Presentation Overview

- **Address how the EREF fits into the need for future domestic and non-domestic uranium enrichment capacity, including:**
  - Current status of existing and potential future sources of enrichment services discussed in the ER and FEIS;
  - Forecasts of installed capacity, relative to the ER for the Reference and High Growth forecasts for 2020 and 2030, that reflect:
    - 50% reduction of installed capacity forecast for domestic capacity
    - 25% reduction of installed capacity forecast for non-U.S. capacity
- **Recent, updated forecast of installed nuclear generating capacity**

# Existing and Projected Enrichment Supply – U.S.

- Domestic projects have experienced some schedule slippage; future U.S. supply is projected to be slightly lower than in ER, Table 1.1-4 (Exh. AES000070).
- USEC Paducah GDP – operation through ~2012/2013 and use of inventory to support transition to USEC ACP
- LES Urenco USA – operational as of June 2010; projected to ramp up to 5.7 million SWU per year (currently licensed for 3 million SWU) by 2016
- USEC ACP – NRC license awarded in April 2007; while not yet committed by DOE, award of DOE loan guarantee assumed during 2011, initial operation in 2014, followed by ramp up to 3.8 million SWU per year by 2018
- U.S. DOE down blended HEU – annual supply between 2013 and 2019 expected to be ~0.3 million SWU; zero thereafter
- AREVA EREF – Awarded conditional DOE loan guarantee in May 2010; if NRC license is awarded by early 2012, then initial operation in 2015, followed by ramp up to 6.4 million SWU per year by 2022
- Transaction and operation tails assays are expected to be slightly lower than assumed in the ER, Section 1.1.2.2, bullet #2 (Exh. AES000070) for both domestic and non-domestic Western enrichers, which results in a slightly lower level of supply at the tails assay stated in the ER in the long-term

# Existing and Projected Enrichment Supply – Non-U.S.

- **Outside the U.S., there has also been some schedule slippage relative to ER (Table 1.1-4)**
  - Urenco Europe – operation and expansion continuing; steady state annual capacity of 14.5 million SWU expected by 2015 (~2 million per year > than in ER)
  - AREVA GB I GDP – operation to continue at minimum level through 2012 and use of inventory to support transition to GB II
  - AREVA GB II – operational as of April 2011; continuing ramp up to 7.5 million SWU per year by 2017
  - Rosatom – expansion continuing as expected; HEU Agreement ends in 2013; sales in U.S. and Europe constrained by trade laws; contracts executed to support limited access to U.S. and elsewhere
  - Recycle –largely unchanged from ER as source of long-term supply
- **There has been an increase in the supply expected from China**
  - China – expectations for indigenous Chinese enrichment capacity have been significantly increased since ER (+8.7 million SWU per year by 2030 to meet a larger share of its internal requirements), as are enrichment requirements for China
- **Overall there have been only small changes in expectations regarding supply, with exception of large increase expected in China**

# Adjusted Forecasts of Installed Nuclear Capacity

- ASLB-requested adjustments to the forecasts of increases in installed nuclear capacity in the ER result in reductions in installed world capacity of between 5.5% for Reference growth forecast in 2020 and 13.1% for the High growth forecast in 2030.

	U.S.		World	
	ER Table 1.1-1 (Gwe)	Adjusted ER (Gwe)	ER Table 1.1-1 (Gwe)	Adjusted ER (Gwe)
Year-Forecast				
2020-Ref	109.6	105.0	465.9	440.3
2030-Ref	118.7	109.5	538.2	488.8
2020-High	112.7	106.5	551.4	503.7
2030-High	129.5	114.9	725.0	629.7

- The ASLB-requested adjustments to the ER result in levels of installed nuclear generation for the period 2020 to 2030 that are lower than recent post-Fukushima forecasts of installed nuclear generation.

# Estimated Impact of ASLB-Requested Adjustments on Enrichment Requirements

- The ASLB-requested adjustments are approximated as a 50% reduction in the net increase in domestic requirements for enrichment services and 25% reduction in the net increase in non-U.S. requirements for enrichment services.
- ASLB-requested adjustments translate into an average annual reduction of 5.3 million SWU per year (8.2%) in world requirements for the period 2016 through 2030 under the Reference growth forecast, as compared to the values provided in ER Table 1.1-3.
- Under the High growth forecast, these adjustments translate into an average annual reduction of 9.4 million SWU per year (11.6%) reduction in world requirements for the period 2016 through 2030, as compared to the values provided in ER Table 1.1-3.
- The enrichment requirements that result from these ASLB requested adjustments are lower than enrichment requirements that would be consistent with recent post-Fukushima forecasts of installed nuclear generation.

# Impact of Adjusted Forecasts on U.S. SWU Supply vs. Requirements

- U.S. requirements for enrichment services continue to exceed U.S. Base Supply over the period 2016 through 2030 for both the Reference and High growth requirements forecasts.
- Without the EREF, U.S. requirements exceed supply by an even greater amount for both the Reference and High growth requirements forecasts.

	U.S. Supply – U.S. Requirements	
	ER Table 1.1-7 (million SWU)	With a -50% Adjustment to the Increase (million SWU)
Period from 2016-2030		
<b>Base-Ref</b>	<b>-0.8</b>	<b>-0.8</b>
<b>Base-High</b>	<b>-1.6</b>	<b>-1.1</b>
<b>No EREF-Ref</b>	<b>-6.2</b>	<b>-5.9</b>
<b>No EREF-High</b>	<b>-7.0</b>	<b>-6.2</b>

# Impact of Adjusted Forecasts on World SWU Supply vs. Requirements

- For Base Supply, world average annual requirements exceed supply for the High growth forecast from 2016 through 2030, but Base Supply exceeds requirements for Reference growth forecast.
- Without the EREF, world average annual requirements exceed supply for the High growth forecast from 2016 through 2030, but supply exceeds requirements for Reference growth forecast.

World Supply – World Requirements	
Period from 2016-2030	ER Table 1.1-6 (million SWU)
Base-Ref	-0.6
Base-High	-9.1
No EREF-Ref	-6.0
No EREF-High	-14.5
	With a -50% Adjustment to the Increase for U.S. and -25% Adjustment to the Increase for non-U.S. (million SWU)
	+5.7
	-0.4
	+0.6
	-5.5



# ERI May 2011 Forecast of Installed Nuclear Generation

- The ERI May 2011 forecast reflects events that occurred subsequent to submittal of the ER.
- These events include:
  - Impact of the Fukushima accident – significant reductions in Japan and Germany, but minimal impact on the rest of the world when compared to the ER
  - U.S. license renewals and power uprates continue following the Fukushima accident
  - Continued expansion of nuclear power in China, which is very significant
  - Downturn in world economy
  - Renewed interest in low-cost natural gas
  - Difficulty in obtaining long-term financing for new nuclear power plants
  - Statements of ongoing support for nuclear power from government and industry leaders in most countries with existing nuclear power programs
- The ERI May 2011 forecast is conservative (low) relative to other post-Fukushima forecasts with regard to expectations for installed nuclear generation capacity in the long-term.
- Commitment to nuclear power remains strong

# **Impact of ERI 2011 Forecast on US and World SWU Supply vs. Requirements**

- **The ERI May 2011 forecast supports the ER analysis.**
  - U.S. requirements exceed U.S.-based supply for both Reference and High growth forecasts from 2016-2030
  - Average annual U.S.-based supply deficit increases slightly from 0.8 to 1.1 million SWU for Reference growth forecast; deficit is greater without EREF, but does not change due to the ERI 2011 forecast.
  - Average annual U.S.-based supply deficit increases slightly from 1.6 to 2.1 million SWU for High growth forecast for Base case; deficit is greater without EREF and increases slightly due to the ERI 2011 forecast.
  - World Base Supply exceeds world requirements for the reference growth forecast from 2016-2030; but world requirements exceed world Base Supply for the High growth forecast during this period.
  - World requirements exceed world Base Supply without EREF for both Reference and High growth forecast from 2016-2030.

# Conclusions

- **With the EREF and all other U.S.-based Base Supply, U.S. requirements for uranium enrichment services are expected to exceed U.S.-based supply over the long-term for both the Reference and High growth forecasts**
- **Without the EREF, U.S. requirements for uranium enrichment services are expected to exceed U.S.-based supply by an even larger amount for both the Reference and High growth forecasts.**
- **With the EREF and all other Base Supply, world supply is expected to exceed world requirements for the Reference growth forecast, but requirements are expected to exceed supply for the High growth forecast.**
- **Without the EREF, world requirements for uranium enrichment services are expected to exceed world supply for both the Reference and High growth forecasts.**