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# OPEN MEETING

ORIGINAL

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## MEMORANDUM

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Arizona Corporation Commission

TO: THE COMMISSION

DOCKETED

2002 DEC -2 A 8: 11

FROM: Utilities Division

DEC 0 2 2002

AZ CORP COMMISSION  
DOCUMENT CONTROL

DATE: November 27, 2002

DOCKETED BY

CAR

RE: ARIZONA PUBLIC SERVICE COMPANY - REQUEST FOR A PARTIAL VARIANCE OF A.A.C. R14-2-1618 TO ALLOW GEOTHERMAL ENERGY TO BE RECOGNIZED FOR THE ENVIRONMENTAL PORTFOLIO STANDARD (DOCKET NO. E-01345A-02-0852)

On November 15, 2002, Arizona Public Service Company ("APS") filed a request for a partial variance of A.A.C. R14-2-1618 to allow geothermal energy to be recognized for the Environmental Portfolio Standard. A.A.C. R14-2-1618 requires utilities to derive a portion of their total retail energy sold from new solar resources or environmentally friendly renewable electricity technologies. The rule currently defines environmentally friendly renewable electricity technologies as in-state landfill gas generators, wind generators, and biomass generators. Geothermal energy is not included.

APS issued a Request for Proposals ("RFP") for renewable energy resources. Vulcan Power responded to the RFP with a geothermal energy proposal. There also appear to be other geothermal energy projects that may be developed in Arizona.

Geothermal energy is the thermal energy contained in the rock and fluid in the earth's crust. In geothermal power plants, the natural hot water and steam from the earth is used to turn turbine generators to produce electricity. Unlike fossil fuel power plants, no fuel is burned. Geothermal plants have no air emissions and do not use water for cooling. Also, Staff is not aware of any other significant environmental impacts from geothermal power generation. Geothermal plants do release a small amount of air pollutants, however, their emission levels are minute compared to natural gas and coal fired plants. Additionally, geothermal plants have a small footprint relative to conventional power plants. Other advantages of geothermal plants are that generation is typically available 95 percent of the time, the plants are modular and can be installed incrementally on an as-needed basis, and plant construction can take as little as six months. Besides power plants, geothermal energy supports greenhouses, fish farms, and other applications.

The U. S. Department of Energy's GeoPowering the West program has identified Arizona as a high-potential state for geothermal electricity generation. Almost half of the state contains good to excellent geothermal resources.

The Vulcan Power proposed project, to be located near Clifton, would extract hot salt water from the ground and pass it through a heat exchanger where the heat from the water would

THE COMMISSION

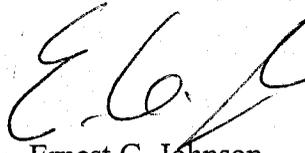
November 27, 2002

Page 2

be transferred to an organic fluid with a low boiling point. The water would be returned to the ground. The organic fluid would turn to vapor that would drive a turbine that generates electricity. After exiting the turbine, the organic fluid would be cooled and condensed to liquid, after which it would be returned to the heat exchanger to be vaporized again. APS would buy the green credits from the project.

There is precedent in Arizona for geothermal energy to be considered renewable energy. One example is A.R.S. 41-806, which requires the Department of Administration to use renewable energy to provide power to facilities in the governmental mall. Geothermal energy is included in the definition of renewable energy.

Because geothermal energy consumes no natural resources and is inherently environmentally friendly Staff believes that APS' request is reasonable. Staff recommends that APS be granted a partial variance of R14-2-1618 to allow geothermal energy to be recognized for the Environmental Portfolio Standard.



Ernest G. Johnson  
Director  
Utilities Division

EGJ:BEK:hml\JMA

ORIGINATOR: Barbara Keene

1 **BEFORE THE ARIZONA CORPORATION COMMISSION**

2 WILLIAM A. MUNDELL  
Chairman  
3 JIM IRVIN  
Commissioner  
4 MARC SPITZER  
Commissioner  
5

6 IN THE MATTER OF ARIZONA PUBLIC )  
SERVICE COMPANY - REQUEST FOR A )  
7 PARTIAL VARIANCE OF A.A.C. R14-2-1618 )  
TO ALLOW GEOTHERMAL ENERGY TO BE )  
8 RECOGNIZED FOR THE ENVIRONMENTAL )  
PORTFOLIO STANDARD )

DOCKET NO. E-01345A-02-0852

DECISION NO. \_\_\_\_\_

ORDER

9  
10 Open Meeting  
December 17 and 18, 2002  
11 Phoenix, Arizona

12 BY THE COMMISSION:

13 FINDINGS OF FACT

14 1. Arizona Public Service Company ("APS") is certificated to provide electric service as a  
15 public service corporation in the State of Arizona.

16 2. On November 15, 2002, APS filed a request for a partial variance of A.A.C. R14-2-1618  
17 to allow geothermal energy to be recognized for the Environmental Portfolio Standard. A.A.C. R14-2-  
18 1618 requires utilities to derive a portion of their total retail energy sold from new solar resources or  
19 environmentally friendly renewable electricity technologies. The rule currently defines  
20 environmentally friendly renewable electricity technologies as in-state landfill gas generators, wind  
21 generators, and biomass generators. Geothermal energy is not included.

22 3. APS issued a Request for Proposals ("RFP") for renewable energy resources. Vulcan  
23 Power responded to the RFP with a geothermal energy proposal. There also appear to be other  
24 geothermal energy projects that may be developed in Arizona.

25 4. Geothermal energy is the thermal energy contained in the rock and fluid in the earth's  
26 crust. In geothermal power plants, the natural hot water and steam from the earth is used to turn  
27 turbine generators to produce electricity. Unlike fossil fuel power plants, no fuel is burned.  
28 Geothermal plants have no air emissions and do not use water for cooling. Also, Staff is not aware of

1 any other significant environmental impacts from geothermal power generation. Geothermal plants do  
2 release a small amount of air pollutants, however, their emission levels are minute compared to natural  
3 gas and coal fired plants. Additionally, geothermal plants have a small footprint relative to  
4 conventional power plants. Other advantages of geothermal plants are that generation is typically  
5 available 95 percent of the time, the plants are modular and can be installed incrementally on an as-  
6 needed basis, and plant construction can take as little as six months. Besides power plants, geothermal  
7 energy supports greenhouses, fish farms, and other applications.

8         5. The U. S. Department of Energy's GeoPowering the West program has identified Arizona  
9 as a high-potential state for geothermal electricity generation. Almost half of the state contains good  
10 to excellent geothermal resources.

11         6. The Vulcan Power proposed project, to be located near Clifton, would extract hot salt  
12 water from the ground and pass it through a heat exchanger where the heat from the water would be  
13 transferred to an organic fluid with a low boiling point. The water would be returned to the ground.  
14 The organic fluid would turn to vapor that would drive a turbine that generates electricity. After  
15 exiting the turbine, the organic fluid would be cooled and condensed to liquid, after which it would be  
16 returned to the heat exchanger to be vaporized again. APS would buy the green credits from the  
17 project.

18         7. There is precedent in Arizona for geothermal energy to be considered renewable energy.  
19 One example is A.R.S. 41-806, which requires the Department of Administration to use renewable  
20 energy to provide power to facilities in the governmental mall. Geothermal energy is included in the  
21 definition of renewable energy.

22         8. Because geothermal energy consumes no natural resources and is inherently  
23 environmentally friendly Staff believes that APS' request is reasonable. Staff has recommended that  
24 APS be granted a partial variance of R14-2-1618 to allow geothermal energy to be recognized for the  
25 Environmental Portfolio Standard.

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28 ...



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DOCKET NO. E-01345A-02-0852

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