

BEFORE THE IOWA UTILITIES BOARD
DEPARTMENT OF COMMERCE
STATE OF IOWA

IN RE:

INTERSTATE
POWER AND LIGHT
COMPANY



DOCKET NO. GCU-07-01

1

DIRECT TESTIMONY OF DR. KRISTEN WELKER-HOOD

2

3 **Q: Please state your name and business address.**

4 A: My name is L. Kristen Welker-Hood. My business address is 1875 Connecticut

5 Avenue NW, Suite 1012, Washington, DC 20009.

6

7 **Q: By whom are you presently employed and in what capacity?**

8 A: I am employed by Physicians for Social Responsibility. I am the Director of

9 Environment and Health Programs for the National Physicians for Social Responsibility

10 Office.

11

12 **Q: What is your educational background?**

13 A: I hold a Doctorate in Environmental Health from Boston University, School of Public

14 Health (Boston, MA), a Masters in Community Health Nursing from Johns Hopkins,

15 School of Nursing (Baltimore, MD), and a Baccalaureate degree in Nursing from State

16 University of New York (Binghamton, NY).

17

1 **Q: Please summarize your professional experience.**

2 I am a nurse and environmental health scientist. My present position is Director of
3 Environment and Health Programs at Physicians for Social Responsibility in Washington,
4 DC. I previously served as Senior Policy Fellow in the Center for Occupational and
5 Environmental Health of the American Nurses Association.

6

7 From 2003 to 2006 I was on the faculty of the University of Texas Medical Branch
8 (UTMB) School of Nursing in Galveston, TX. While at UTMB, I taught both didactic
9 and clinical courses, including Case Management, Community Health and Pediatric
10 Nursing. My clinical experience has been in oncology and pediatric public health and I
11 have worked as an oncology nurse at the Lahey Clinic in Massachusetts and the Johns
12 Hopkins Medical Center.

13

14 My public health nursing experience includes program evaluation, done for the National
15 Center for Lead Safe Housing, of state and city-directed clinical case management
16 programs for lead-poisoned children. I also served as the Community Health Nurse
17 Researcher working with investigators from Harvard, Boston and Tufts Universities on
18 the Healthy Public Housing Initiative which explored the relationship between indoor air
19 pollution and childhood asthma.

20

21 My recent publications include *Global Climate Change and the Nurses Role in American*
22 *Nurses Today and *Regulatory, Institutional and Market-Based Approaches Towards**
23 **Achieving Comprehensive Chemical Policy Reform in Online Journal of Issues in**

1 Nursing.

2

3 My curriculum vitae is also attached as an appendix to this testimony.

4

5 **Q: Have you testified in prior Iowa Utilities Board regulatory proceedings or other**
6 **state or federal utility regulatory proceedings?**

7 A: No.

8

9 **Q: On whose behalf are you testifying in this case?**

10 A: I am testifying on behalf of the Joint Intervenors Community Energy Solutions, Iowa
11 Environmental Council, Iowa Farmers Union, Iowa Physicians for Social Responsibility
12 and Iowa Renewable Energy Association.

13

14 **Q: Are you sponsoring any exhibits as part of this filing?**

15 A: Yes. All references cited in this testimony are appended as exhibits.

16

17 **Q: Please summarize the conclusions you have reached in your testimony.**

18 A: My conclusions are as follows:

19 1. The significant emissions of carbon dioxide and other heat-trapping greenhouse
20 gases that would result from operation of the proposed SGS Unit 4 coal plant pose
21 a serious threat to climate stability and correspondingly to public health.

1 2. The emissions of regulated criteria and toxic air emissions from operation of the
2 proposed SGS Unit 4 coal plant would have a number of adverse effects on public
3 health.

4 3. The construction and operation of the proposed SGS Unit 4 coal plant is *not*
5 consonant with reasonable utilization of air, land and water resources.

6 4. Considering available technology and the economics of available alternatives, the
7 proposed SGS Unit 4 coal plant *does not* represent a reasonable choice among
8 available alternatives.

9

10 **Q: Please discuss the potential impacts on public health that would result from**
11 **construction and operation of the proposed Sutherland Generating Station (SGS)**
12 **Unit 4 coal plant?**

13

14 A: There is now scientific consensus, as expressed by the United Nations
15 Intergovernmental Panel on Climate Change (IPCC)(Joint Intervenors' Exhibit ___
16 (KWH-1), Schedule A), that anthropogenic greenhouse gas emissions from the
17 combustion of fossil fuels are warming the planet and that this human-induced climate
18 change has grave implications for public health (Joint Intervenors' Exhibit _____
19 (KWH-1), Schedule B). As a nurse, as a public health professional and as Director of
20 Physicians for Social Responsibility's (PSR) Environment and Health Programs, I
21 believe that the significant emissions of carbon dioxide and other heat-trapping
22 greenhouse gases that would result from construction and operation of the proposed SGS
23 Unit 4 coal plant represent a serious threat to public health.

1

2 The health effects of global warming already are apparent around the world. The World
3 Health Organization estimates that climate change causes more than 150,000 deaths
4 annually across the globe, with this mortality burden overwhelmingly concentrated on
5 children in poorer countries (Joint Intervenors' Exhibit ____ (KWH-1), Schedule C).

6 While developing nations will be disproportionately burdened by the adverse health
7 effects of global warming, the American public will also face increasing health risks from
8 more frequent and severe heat waves, increasingly intense floods, droughts and
9 hurricanes, and rising incidences of pest and waterborne disease (Joint Intervenors'
10 Exhibit _____ (KWH-1), Schedule D). As the inadequate response to Hurricane Katrina
11 demonstrated, the U.S. medical and public health community is not prepared for multiple,
12 large scale disasters that will manifest themselves as a result of climate change. Similar to
13 the disparity in climate change health impacts observed at the global level, the effects
14 here in the U.S. will likely be most severe among those who are poor, suffer from pre-
15 existing disease and/or lack access to adequate health care and other support services.

16

17 The most recent IPCC report confirms that the frequency and duration of heat waves
18 across the U.S. has increased over the last 50 years as a result of climate change. In the
19 summer of 2003, record breaking heat waves across Europe claimed an estimated 35,000
20 lives, tragically demonstrating the potentially disastrous consequences of a continued
21 trend of increasingly frequent extreme heat events (Joint Intervenors' Exhibit ____
22 (KWH-1), Schedule E). Here in Iowa, the number of days above 90°F is projected to
23 increase two- to five-fold and by 2080-2100, Iowa could experience 30 to 60 extreme

1 heat days (exceeding 97 °F) annually (Joint Intervenors' Exhibit __ (KWH-1), Schedule
2 F). In cities around the country, increasing extreme heat events will be magnified by the
3 urban heat island effect. Researchers estimate that Chicago will experience 25 percent
4 more frequent heat waves under a business-as-usual scenario, while the number of annual
5 heat wave days in Los Angeles will rise from 12 to between 44 and 95 – the upper end of
6 this range marking a 692 percent increase (Joint Intervenors' Exhibit ____ (KWH-1),
7 Schedule G). Extreme heat, already the number one cause of weather-related deaths in
8 the U.S., will become an increasing public health burden if global warming is left
9 unmitigated.

10

11 Although ambient air pollutant concentrations have generally fallen since passage of the
12 1970 Clean Air Act, more than 100 million Americans live in areas where ozone levels
13 exceed the U.S. Environmental Protection Agency's 8-hour air quality standard and rates
14 of asthma and other respiratory diseases continue to rise. Global warming will undermine
15 efforts to improve air quality as rising temperatures accelerate ozone formation during
16 summer months. A recent study published in the journal Climatic Change projects that
17 across 50 U.S. cities, the number of unsafe air days – days when ozone levels exceed the
18 U.S. Environmental Protection Agency's 8-hour air quality standard – will increase by 68
19 percent (Joint Intervenors' Exhibit __ (KWH-1), Schedule G). The study also estimates
20 that the number of unhealthy “red alert” days – days when everyone, young and old,
21 healthy and infirm are advised to avoid prolonged outdoor exertion – is expected to more
22 than double across these 50 cities. Left unaddressed, rising ozone concentrations will
23 cause serious respiratory and cardiovascular health problems in America's cities.

1

2 Global warming also will create conditions more favorable to certain insect and rodent
3 populations that carry and spread disease. The geographic range of illnesses such as
4 Lyme disease (spread by ticks), hantavirus (spread by rodents) and West Nile Virus
5 (spread by mosquitoes) have already expanded as a result of rising temperatures and
6 changing precipitation patterns. West Nile Virus, virtually unseen in the U.S. as recently
7 as 1999, has spread to 47 states. To date, more than 25,000 cases of West Nile Virus have
8 been reported across the country and more than 1,000 deaths have been recorded (Joint
9 Intervenors' Exhibit __ (KWH-1), Schedule H).

10

11 **Q. Are your concerns regarding the potential health impacts of climate change**
12 **shared within the wider medical and public health community?**

13

14 A. Yes. An increasing number of major medical associations and public health agencies
15 have formally recognized the risks to human health posed by climate change:

16

17 • The Centers for Disease Control and Prevention (CDC), the nation's leading public
18 health protection agency, has recognized climate change as a serious public health
19 concern. In testimony before the Senate Committee on Environment and Public
20 Works, CDC Director Dr. Julie Gerberding stated that "climate change is anticipated
21 to have a broad range of impacts on the health of Americans and on the nation's
22 public health infrastructure" (Joint Intervenors' Exhibit __ (KWH-1), Schedule I). This
23 range of impacts, outlined in its official "CDC Policy on Climate Change and Public

1 Health,” includes those health risks highlighted above and more (Joint Intervenors’
2 Exhibit ___ (KWH-1), Schedule J).

3

4 • In a letter addressed to Senator Barbara Boxer dated October 22, 2007, Dr. David
5 Heymann, Assistant Director-General for Communicable Diseases at the World
6 Health Organization (WHO) states that, “WHO has concluded that climate change
7 brings major new challenges to health security, and will increase the costs and
8 difficulties of disease control” (Joint Intervenors’ Exhibit _____ (KWH-1), Schedule
9 K).

10

11 • During its 2007 annual meeting, the Association of State and Territorial Health
12 Officials (ASTHO) unanimously adopted a position statement titled, “Climate
13 Change and Public Health,” which “recognizes that climate change has serious far-
14 reaching implications for the health of this and future generations” (Joint Intervenors’
15 Exhibit ___ (KWH-1), Schedule L).

16

17 • The National Association of County and City Health Officials (NACCHO), in an
18 official statement of policy very similar to that approved by ASTHO, acknowledges
19 that “climate change has serious far-reaching health implications for this and future
20 generations” (Joint Intervenors’ Exhibit _ (KWH-1), Schedule M).

21

22 • For more than 10 years the American Public Health Association (APHA) has
23 recognized the potential human health consequences of climate change and has

1 recommended “precautionary primary preventive measures to avert climate change,
2 including reduction of greenhouse gas emissions...through appropriate energy and
3 land use policies” (Joint Intervenors’ Exhibit ___ (KWH-1), Schedule N). In a recent
4 letter sent to Senator Barbara Boxer, APHA Executive Director Dr. Georges
5 Benjamin writes, “the public health community has a critical role to play in
6 advocating for both mitigation of climate change and adaptation to the negative
7 public health effects that will result” (Joint Intervenors’ Exhibit _____ (KWH-1),
8 Schedule O).

9

10 • Physicians for Social Responsibility has issued a “Call to Action” urging members of
11 Congress to acknowledge the growing health threats posed by global warming and to
12 enact mandatory controls on greenhouse gas emissions (Joint Intervenors’ Exhibit ___
13 (KWH-1), Schedule P). The “Call to Action” has been signed by 115 distinguished
14 physicians, including professors from 15 medical schools, a former governor, two
15 Nobel Laureates and former Surgeon General David Satcher. The “Call to Action” is
16 also supported by the American Nurses Association, the American Public Health
17 Association and the Association of Pediatric Nurse Practitioners. Together, these
18 groups represent more than 200,000 physicians, nurses and public health
19 professionals around the country.

20

21 **Q: Climate change is the result of atmospheric accumulation of greenhouse gas**
22 **emissions that span both temporal and geographic boundaries, such that emissions**
23 **from the latter half of the 19th century, emissions from China and emissions that**

1 **would be produced by the proposed SGS Unit 4 facility all have the same warming**
2 **effect. In light of this fact, would denying the construction permit for SGS Unit 4**
3 **confer any benefits to the climate system and thereby reduce the potential health**
4 **impacts of climate change?**

5
6 A: A growing body of scientific evidence indicates that rising atmospheric concentrations
7 of anthropogenic greenhouse gases are pushing the earth ever closer to dangerous tipping
8 points in the climate system, beyond which a number of severe ecological and societal
9 impacts will become unavoidable (see Hansen Testimony). Considered in this context of
10 climate tipping points, the proposed SGS Unit 4 coal plant poses a clear danger to climate
11 stability and correspondingly to public health.

12
13 As party to the United Nations Framework Convention on Climate Change, the U.S. is
14 committed to the objective of “stabilization of greenhouse gas concentrations in the
15 atmosphere at a level that would prevent dangerous anthropogenic interference with the
16 climate system.” Though “dangerous anthropogenic interference” is not well defined in
17 the UNFCCC, limiting global warming to 2°C is increasingly recognized as a target that
18 would provide an acceptable likelihood of preventing runaway positive feedbacks to the
19 climate system and avoiding the worst impacts of climate change (Joint Intervenors’
20 Exhibit _____ (KWH-1), Schedule Q). To achieve this target, global emissions must
21 peak within ten years and be reduced to 50 percent below 2000 levels by mid-century,
22 such that atmospheric greenhouse gas concentrations are ultimately stabilized at 450 parts
23 per million (ppm) (Joint Intervenors’ Exhibit _____ (KWH-1), Schedule R).

1 Recognizing the “common but differentiated responsibilities” embodied in the UNFCCC,
2 the U.S., which has contributed more than one quarter of cumulative global greenhouse
3 gas emissions, must reduce its emissions at least 80 percent below 2000 levels by 2050
4 (Joint Intervenors’ Exhibit __ (KWH-1), Schedule S).

5
6 Given the narrow window of time in which we must slow, stop and reverse current
7 emissions trends, the prospects for achieving both short and long-term emission reduction
8 targets would be undermined substantially by construction and operation of the proposed
9 SGS Unit 4 coal plant. SGS Unit 4 would emit an estimated 5.9 million tons of CO₂
10 annually and 297 million tons over the average 50 year lifespan of a coal-fired power
11 plant. To put this in perspective, emissions from the operation of SGS Unit 4 would
12 negate more than 90 percent of the CO₂ reductions that would be achieved in New York
13 State under draft regulations for implementing the Regional Greenhouse Gas Initiative
14 (RGGI) (Joint Intervenors’ Exhibit __ (KWH-1), Schedule T).

15
16 The proposed construction of the SGS Unit 4 power plant would undercut not only the
17 actions being taken by the 10 northeastern RGGI states, but also the emission reduction
18 efforts underway in a growing number of states and municipalities across the country.
19 Moreover, consideration of the proposed SGS Unit 4 runs directly counter to the
20 alternative low-carbon energy policies currently under evaluation by the Iowa Climate
21 Change Advisory Council.

22

1 **Q: Your testimony has focused primarily on the CO2 emissions that would be**
2 **produced by operation of the proposed SGS Unit 4 facility. Are there other potential**
3 **public health impacts that would result from operation of the SGS Unit 4 coal plant**
4 **that you wish to identify?**

5
6 A: Yes. In addition to significant emissions of CO2, operation of the SGS Unit 4 coal
7 plant would also produce significant quantities of criteria and toxic air pollutants.
8 According to Volume I of IPL's application for a generating facility citing certificate,
9 operation of SGS Unit 4 would result in the emission of 1,956 tons of sulfur dioxide
10 (SO2), 1,956 tons of nitrogen oxides (NOx), 98 tons of volatile organic compounds
11 (VOC), 418 tons of particulates and 0.24 tons (480 pounds) of mercury. These emissions
12 pose a range of serious health risks to citizens residing both inside Iowa and in
13 neighboring states.

14
15 In the presence of sunlight, NOx and VOC emissions from SGS Unit 4 will react to form
16 ground-level ozone, commonly known as smog. Smog is a powerful respiratory irritant
17 that can damage lung tissue, reduce lung function and exacerbate asthma, bronchitis and
18 other respiratory diseases. Recent studies demonstrate that ozone exposure also may lead
19 to premature death (Joint Intervenors' Exhibit _____ (KWH-1), Schedule U).

20
21 Particulate matter also presents a number of serious risks to respiratory and
22 cardiovascular health. SGS Unit 4 would increase particle pollution concentrations both
23 through direct particulate emissions and indirectly through the formation of particulate

1 matter from atmospheric reactions of NOx and SO2. These direct and indirect emissions
2 would exacerbate the already staggering public health burden of particle pollution; a
3 recent study estimated that particulate matter from coal plants is responsible for nearly
4 24,000 premature deaths each year in the U.S. (Joint Intervenors' Exhibit _ (KWH-1),
5 Schedule V).

6

7 The 408 pounds of mercury that would be emitted annually by SGS Unit 4 are
8 particularly threatening to fetal and child development. After mercury is released to the
9 air, it is deposited in bodies of water where it is converted to methylmercury (an organic
10 form) that accumulates in fish. Fetal exposure to mercury via maternal consumption of
11 contaminated fish can cause mental retardation and brain damage, while continued
12 exposure during early childhood can result in learning disabilities and attention deficit
13 disorders (Joint Intervenors' Exhibit _ (KWH-1), Schedule W).

14

15 **Q: In rendering its decision on the siting application for the SGS Unit 4 facility, the**
16 **Iowa Utilities Board must consider the facility siting criteria outlined in Iowa Code**
17 **476A.6 and in IAC 199-24. Does the proposed SGS Unit 4 facility meet these**
18 **criteria?**

19 A: No. As highlighted earlier in this testimony, operation of SGS Unit 4 would produce
20 5.9 million tons of CO2 emissions annually. The exacerbation of global warming caused
21 by these emissions will adversely affect public health through significant negative
22 impacts on extreme weather patterns, water quality and quantity, air quality, and vector-
23 borne disease incidence. Air quality and public health will also be adversely affected by

1 the significant emissions of criteria and toxic air pollutants from operation of SGS Unit 4.
2 Therefore, the proposed SGS Unit 4 facility is *not* consonant with reasonable utilization
3 of air, land and water resources.

4

5 Further, considering available technology and the economics of available alternatives, the
6 proposed site *does not* represent a reasonable choice among available alternatives (see
7 Schlissel Testimony). I concur with the Iowa Office of the Consumer Advocate that when
8 risks to consumers and the public associated with building a new coal-fired power plant
9 are properly calculated, lower-cost and environmentally-friendly energy efficiency and
10 renewable energy generation resources have the clear advantage over Interstate Power
11 and Light's deeply flawed proposal.

12

13 Given the proposed SGS Unit 4 coal plant's failure to meet the decision criteria outlined
14 in Iowa Code 476A.6 and IAC 199-24, I ask that the Iowa Utilities Board deny IPL's
15 application for a generating facility citing certificate for reasons of both law and good
16 public policy.

17

18 **Q: Does this conclude your testimony?A: Yes.**

