

Appendices

# Railbelt Energy Study

Ater Wynne LLP

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Railbelt Energy Study Appendices

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# Appendix A

## Description of Model

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### Appendix A.1 Dispatch Sub-Module

The Dispatch Sub-Module is a single Excel workbook, containing a Visual Basic for Application (VBA) macro. The macro executes every time Crystal Ball generates a set of random variables, calculating the annual production cost required to satisfy the specified load for each potential portfolio. It is structured as follows:

#### Dispatch Sub-Module Visual Basic Macro Outline

1. Loop through Crystal Ball random draws
  - Calculate (in sheets) annual fuel prices, annual and hourly loads, and annual hydro energy for this draw
2. Loop through portfolios (combinations of unit additions)
  3. Loop through years
    - Read transmission characteristics data
    - Read existing resources data
    - Read new resource additions data
    - Allocate annual hydro energy of three hydro stations to each hour block by flattening the remaining total load of three areas across 60 blocks of hours
  4. Loop through months
    5. Loop through hours
      - For each area, read demand and reduce it by hydro generation
      - Dispatch resources starting from the lowest cost units of all three areas without trading until one area's load is satisfied
      - Continue to dispatch allowing trading between areas until demands of all areas are satisfied, taking into account available transmission and transmission losses
      - Calculate required spinning reserve in each area and dispatch additional resources to fulfill the requirements
      - Calculate hourly production cost, and accumulate annual production cost
    - End of hour loop (5)
    - End of month loop (4)
      - Write annual production cost to sheet Results
    - End of year loop (3)
    - End of portfolio loop (2)
    - End of draw loop (1)

# Appendix A.2 Reliability Module

The Reliability Module consists of a single Excel workbook, with a VBA macro. The macro calculates Loss of Load Probability (LOLP) and Expected Loss of Energy (ELOE) in each area associated with a set of annual loads in the three areas and a specific set of generating units. The macro is structured as follows:

## Reliability Module Visual Basic Macro Outline

1. Read transmission link information and calculate probability of combinations of outage of links
2. Loop through cases
  3. Loop through years
    - Read existing resources for the year
    - Read new resource additions for the year
    - Calculate resource availability curve for each area by looping through all possible combinations of outages of generating units. Calculate the probability of each combination occurring, and for each combination, calculate the total available capacity for each area. The probabilities of the same available capacity are accumulated for each area.
    - Read load for the year (60 blocks of hours)
  4. Loop through capacity of Fairbanks (from 0 to total capacity of all units in Fairbanks)
    5. Loop through capacity of Healy
      6. Loop through capacity of Anchorage
        7. Loop through capacity of Kenai
          8. Loop through hours
            9. Loop through link combinations
              - Calculate unserved energy in each area for the capacity/link outage combination by dispatching the available capacity and trying to satisfy the load of this hour with the constraint of transmission capacity of this specific link combination
            - End of link combination loop (9)
            - Calculate probability and expected unserved energy across link combination for each area of the specific hour
            - End of hour loop (8)
          - End of Kenai loop (7)
        - End of Anchorage loop (6)
      - End of Healy loop (5)
    - End of Fairbanks loop (4)
      - Calculate LOLP for each hour across capacity combinations
      - Calculate LOLP for the year across blocks of hours
      - Write outputs
    - End of year loop (3)
  - End of case loop (2)

---

## Appendix A.3 Investment Module

The Investment Module is structured as follows:

### Investment Module Visual Basic Macro Outline

#### 1. Read Data

- Cost parameters for each portfolio/year
- Load and natural gas price stochastic parameters for each year
- Portfolio descriptions
- Stochastic factor transition probabilities

#### 2. Calculate portfolio transition matrix (i.e., is it possible to go from portfolio A to portfolio B?)

##### 3. Loop through decision years (backwards, from 2029 to 2004)

##### 4. Loop through possible previous year Fairbanks load values

##### 5. Loop through possible Anchorage load values

##### 6. Loop through possible Kenai load values

##### 7. Loop through possible gas price values

##### 8. Loop through portfolios

- Calculate expected cost in year +4 and its square, including penalty if reserve margin requirements are not satisfied
- Calculate NPV of expected cost in years +5, years +6, etc., taking into account both probabilities of Fairbanks load, etc., evolving to various future values and the future decisions that would be made in response to different paths of these variables

End of portfolio loop (8)

##### 9. Loop through all possible previous decisions (portfolios)

##### 10. Loop through all possible portfolios that could be selected this year

- Select the portfolio that is feasible to transition to from the previous portfolio with the lowest NPV of expected costs

End of this year portfolio loop (10)

End of previous year portfolio loop (9)

End of gas price loop (7)

End of Kenai load loop (6)

End of Anchorage load loop (5)

End of Fairbanks load loop (4)  
End of decision year loop (3)

At this point, have a matrix of decisions—for every decision year, previous portfolio, and values of the four stochastic variables, the portfolio that should be selected.

11. Loop through decision years (2004 to 2029)
    - Set previous year portfolio=1 for first decision year
  12. Loop through possible previous year Fairbanks load values
  13. Loop through possible previous year Anchorage load values
  14. Loop through possible previous year Kenai load values
  15. Loop through possible previous year gas price values
    - Select portfolio and write results
- End of gas price loop (15)  
End of Kenai load loop (14)  
End of Anchorage load loop (13)  
End of Fairbanks load loop (12)  
End of decision year loop (11)

# Appendix B Description of Data

## Appendix B.1 Transmission System Characteristics

Forced outage rates and loss factors for the transmission facilities are provided in Table B.1

Table B.1  
Transmission System Characteristics

| <b>Characteristics of Existing Transmission System:</b>                        |            |                      |   |  |
|--|------------|----------------------|---|--|
| <b>From:</b>   | <b>To:</b> | <b>Capacity (MW)</b> | <b>Effective Forced Outage Rate (%)</b> | <b>Loss Equation (MW)</b>  |
| Fairbanks  | Healy      | 125                  | 0.3%                                    | $= 0.00036974 \times \text{Export}^2 - 0.00550117 \times \text{Export} + 0.143628$ |
| Healy  | Fairbanks  | 125                  | 0.3%                                    | $= 0.00036974 \times \text{Export}^2 - 0.00550117 \times \text{Export} + 0.143629$ |
| Healy  | Anchorage  | 75                   | 2.0%                                    | $= .000674 \times \text{Export}^2$   |
| Anchorage  | Healy      | 75                   | 2.0%                                    | $= .000674 \times \text{Export}^2$   |
| Anchorage  | Kenai      | 75                   | 3.1%                                    | $= 0.00148 \times \text{Export}^2 + 0.01318 \times \text{Export} + 0.05$           |
| Kenai  | Anchorage  | 75                   | 3.1%                                    | $= 0.00153 \times \text{Export}^2 - 0.00926 \times \text{Export} + 0.05$           |
| <b>Characteristics of Transmission System with Proposed Southern Intertie:</b> |            |                      |   |  |
| <b>From:</b>   | <b>To:</b> | <b>Capacity (MW)</b> | <b>Effective Forced Outage Rate (%)</b> | <b>Loss Equation MW</b>  |
| Fairbanks  | Healy      | 125                  | 1.5%                                    | $= 0.00036974 \times \text{Export}^2 - 0.00550117 \times \text{Export} + 0.143628$ |
| Healy  | Fairbanks  | 125                  | 1.5%                                    | $= 0.00036974 \times \text{Export}^2 - 0.00550117 \times \text{Export} + 0.143629$ |
| Healy  | Anchorage  | 75                   | 2.0%                                    | $= .000674 \times \text{Export}^2$   |
| Anchorage  | Healy      | 75                   | 2.0%                                    | $= .000674 \times \text{Export}^2$   |
| Anchorage  | Kenai      | 125                  | 0.4%                                    | $= 0.00028 \times \text{Export}^2$   |
| Kenai  | Anchorage  | 125                  | 0.4%                                    | $= 0.00028 \times \text{Export}^2$   |



## Appendix B.2 Existing Generating Resource Characteristics

Detailed existing generation unit information is presented in Table B.2; this data supplements the summary data is provided in Table 3-1.

**Table B.2**  
Detailed Characteristics of Existing Generating Units

| Name                 | Area* | Technology/<br>Fuel** | Heat Rate<br>(Btu / kWh) | Variable<br>O&M (2003<br>\$/ MWh) | Fixed O&M<br>(2003 \$ /<br>kW-year) | Maintenance<br>Rate | Forced<br>Outage Rate | Monthly Maximum Capacity |     |     |     |     |     |     |     |     |     |     |     | Maintenance<br>Season |     |     |         |
|----------------------|-------|-----------------------|--------------------------|-----------------------------------|-------------------------------------|---------------------|-----------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------------|-----|-----|---------|
|                      |       |                       |                          |                                   |                                     |                     |                       | Jan                      | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                       |     |     |         |
| Aurora Chena         | F     | ST/Coal               | -                        | 37.0                              | 0.0                                 | 14%                 | 1%                    | 16                       | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16                    | 16  | 16  | May-Aug |
| North Pole 1         | F     | CT/HAGO               | 10,370                   | 3.3                               | 10.6                                | 1%                  | 2%                    | 63                       | 62  | 57  | 52  | 49  | 48  | 47  | 48  | 50  | 53  | 60  | 63  | 63                    | 63  | 63  | Sep-Apr |
| North Pole 2         | F     | CT/HAGO               | 9,869                    | 3.3                               | 10.6                                | 1%                  | 2%                    | 65                       | 65  | 60  | 56  | 50  | 48  | 47  | 49  | 52  | 58  | 63  | 65  | 65                    | 65  | 65  | Sep-Apr |
| Healy 1              | H     | ST/Coal               | 13,360                   | 8.4                               | 168.1                               | 4%                  | 2%                    | 27                       | 27  | 27  | 27  | 27  | 27  | 27  | 27  | 27  | 27  | 27  | 27  | 27                    | 27  | 27  | May-Aug |
| Beluga Unit 1        | A     | CT/NG                 | 17,283                   | 4.6                               | 13.1                                | 3%                  | 2%                    | 20                       | 20  | 20  | 20  | 19  | 19  | 19  | 19  | 19  | 20  | 20  | 20  | 20                    | 20  | 20  | Sep-Apr |
| Beluga Unit 2        | A     | CT/NG                 | 17,918                   | 4.6                               | 13.1                                | 3%                  | 2%                    | 20                       | 20  | 20  | 20  | 19  | 19  | 19  | 19  | 19  | 20  | 20  | 20  | 20                    | 20  | 20  | Sep-Apr |
| Beluga Unit 3        | A     | CT/NG                 | 12,288                   | 4.6                               | 9.9                                 | 5%                  | 2%                    | 69                       | 67  | 67  | 63  | 60  | 58  | 58  | 58  | 60  | 63  | 67  | 69  | 69                    | 69  | 69  | Sep-Apr |
| Beluga Unit 5        | A     | CT/NG                 | 12,538                   | 4.6                               | 9.8                                 | 5%                  | 2%                    | 73                       | 71  | 71  | 67  | 64  | 61  | 61  | 61  | 64  | 67  | 71  | 73  | 73                    | 73  | 73  | Sep-Apr |
| Beluga Unit 6/8      | A     | CC/NG                 | 9,620                    | 4.6                               | 12.2                                | 10%                 | 4%                    | 109                      | 108 | 108 | 107 | 101 | 98  | 98  | 98  | 101 | 107 | 108 | 109 | 109                   | 109 | 109 | May-Aug |
| Beluga Unit 7/8      | A     | CC/NG                 | 9,884                    | 4.6                               | 12.3                                | 10%                 | 4%                    | 109                      | 108 | 108 | 107 | 101 | 98  | 98  | 98  | 101 | 107 | 108 | 109 | 109                   | 109 | 109 | May-Aug |
| International 1      | A     | CT/NG                 | 16,121                   | 4.6                               | 8.6                                 | 3%                  | 2%                    | 15                       | 15  | 15  | 14  | 13  | 13  | 13  | 13  | 13  | 14  | 15  | 15  | 15                    | 15  | 15  | Sep-Apr |
| International 2      | A     | CT/NG                 | 17,388                   | 4.6                               | 8.6                                 | 3%                  | 2%                    | 15                       | 14  | 14  | 14  | 13  | 13  | 13  | 13  | 13  | 14  | 14  | 15  | 15                    | 15  | 15  | Sep-Apr |
| International 3      | A     | CT/NG                 | 15,127                   | 4.6                               | 7.9                                 | 5%                  | 2%                    | 19                       | 19  | 19  | 18  | 17  | 17  | 17  | 17  | 17  | 18  | 19  | 19  | 19                    | 19  | 19  | Sep-Apr |
| ML&P Plant1 Unit 1   | A     | CT/NG                 | 15,413                   | 4.8                               | 19.0                                | 0%                  | 0%                    | 17                       | 17  | 16  | 15  | 15  | 14  | 14  | 14  | 15  | 15  | 17  | 16  | 16                    | 16  | 16  | May-Aug |
| ML&P Plant1 Unit 2   | A     | CT/NG                 | 14,286                   | 4.8                               | 19.0                                | 2%                  | 2%                    | 17                       | 17  | 16  | 15  | 15  | 14  | 14  | 14  | 15  | 15  | 17  | 16  | 16                    | 16  | 16  | Sep-Apr |
| ML&P Plant1 Unit 3   | A     | CT/NG                 | 14,280                   | 4.8                               | 19.0                                | 6%                  | 6%                    | 20                       | 20  | 20  | 19  | 18  | 18  | 18  | 18  | 18  | 19  | 20  | 20  | 20                    | 20  | 20  | Sep-Apr |
| ML&P Plant1 Unit 4   | A     | CT/NG                 | 14,082                   | 4.8                               | 12.0                                | 6%                  | 1%                    | 35                       | 35  | 34  | 33  | 32  | 31  | 31  | 31  | 32  | 33  | 35  | 34  | 34                    | 34  | 34  | Sep-Apr |
| ML&P Plant2 Unit 5/6 | A     | CC/NG                 | 10,256                   | 4.8                               | 47.0                                | 8%                  | 12%                   | 49                       | 49  | 49  | 47  | 46  | 45  | 45  | 45  | 46  | 47  | 49  | 49  | 49                    | 49  | 49  | May-Aug |
| ML&P Plant2 Unit 7/6 | A     | CC/NG                 | 9,010                    | 4.8                               | 28.0                                | 8%                  | 2%                    | 110                      | 110 | 107 | 104 | 102 | 100 | 100 | 100 | 102 | 104 | 110 | 107 | 107                   | 107 | 107 | May-Aug |
| ML&P Plant2 Unit 8   | A     | CT/NG                 | 11,768                   | 4.8                               | 10.0                                | 4%                  | 2%                    | 88                       | 88  | 85  | 83  | 80  | 77  | 77  | 77  | 80  | 83  | 88  | 85  | 85                    | 85  | 85  | Sep-Apr |
| Bernice Lake 2       | K     | CT/NG                 | 14,655                   | 4.6                               | 8.9                                 | 5%                  | 2%                    | 19                       | 19  | 19  | 19  | 18  | 17  | 17  | 17  | 18  | 19  | 19  | 19  | 19                    | 19  | 19  | Sep-Apr |
| Bernice Lake 3       | K     | CT/NG                 | 13,460                   | 4.6                               | 8.2                                 | 3%                  | 2%                    | 28                       | 27  | 27  | 25  | 24  | 23  | 23  | 23  | 24  | 25  | 27  | 28  | 28                    | 28  | 28  | Sep-Apr |
| Bernice Lake 4       | K     | CT/NG                 | 13,639                   | 4.6                               | 8.5                                 | 3%                  | 2%                    | 23                       | 23  | 23  | 23  | 23  | 23  | 23  | 23  | 23  | 23  | 23  | 23  | 23                    | 23  | 23  | Sep-Apr |
| Nikiski              | K     | CT/NG                 | 11,600                   | 4.6                               | 7.5                                 | 0%                  | 2%                    | 42                       | 41  | 41  | 38  | 37  | 35  | 35  | 35  | 37  | 38  | 41  | 42  | 42                    | 42  | 42  | Sep-Apr |

\*F=Fairbanks, H=Healy, A=Anchorage, K=Kenai

\*\* ST=Steam, CT=Simple Cycle Combustion Turbine, CC=Combined Cycle Combustion Turbine, HAGO=High Atmospheric Gas Oil, NG=Natural Gas

## Appendix B.3 Potential New Generating Resource Characteristics

Detailed characteristics for potential new generating units are provided in Tables B.3(a) and B.3(b).

Table B.3(a)  
Detailed Characteristics of Potential New Generic Generating Units

| Name/Technology*      | Fuel Type** | Heat Rate (Btu / kWh) | Variable O&M (2003 \$ / MWh) | Fixed O&M (2003 \$ / kWyear) | Maintenance Rate | Forced Outage Rate | Capital Cost (2003 \$ / kW) | Monthly Maximum Capacity |     |     |     |     |     |     |     |     |     |     |         | Maintenance Season |
|-----------------------|-------------|-----------------------|------------------------------|------------------------------|------------------|--------------------|-----------------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|--------------------|
|                       |             |                       |                              |                              |                  |                    |                             | Jan                      | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec     |                    |
| LM2500 CCCT           | NG/FO       | 7,400                 | 6                            | 80                           | 6%               | 3%                 | 1,400                       | 30                       | 30  | 30  | 30  | 28  | 27  | 27  | 27  | 28  | 30  | 30  | 30      | May-Aug            |
| LM6000PC CCCT         | NG/FO       | 7,200                 | 5                            | 47                           | 6%               | 3%                 | 1,100                       | 60                       | 60  | 60  | 59  | 56  | 54  | 54  | 56  | 59  | 60  | 60  | May-Aug |                    |
| 6B CCCT               | NG/FO       | 7,800                 | 5                            | 47                           | 6%               | 3%                 | 1,150                       | 65                       | 65  | 65  | 64  | 61  | 59  | 59  | 61  | 64  | 65  | 65  | May-Aug |                    |
| 7EA CCCT              | NG/FO       | 7,500                 | 4                            | 28                           | 6%               | 3%                 | 1,000                       | 130                      | 129 | 129 | 128 | 121 | 117 | 117 | 117 | 121 | 128 | 129 | 130     | May-Aug            |
| 7FA CCCT              | NG/FO       | 6,800                 | 4                            | 15                           | 6%               | 3%                 | 900                         | 260                      | 259 | 259 | 256 | 243 | 235 | 235 | 235 | 243 | 256 | 259 | 260     | May-Aug            |
| LM2500 SCCT           | NG/FO       | 10,900                | 6                            | 19                           | 4%               | 4%                 | 1,100                       | 25                       | 24  | 24  | 23  | 22  | 21  | 21  | 21  | 22  | 23  | 24  | 25      | Sep-Apr            |
| LM6000PC SCCT         | NG/FO       | 9,600                 | 6                            | 12                           | 4%               | 4%                 | 1,100                       | 40                       | 39  | 39  | 37  | 35  | 34  | 34  | 34  | 35  | 37  | 39  | 40      | Sep-Apr            |
| 6B SCCT               | NG/FO       | 11,900                | 5                            | 12                           | 4%               | 4%                 | 1,150                       | 42                       | 41  | 41  | 38  | 37  | 35  | 35  | 35  | 37  | 38  | 41  | 42      | Sep-Apr            |
| 7EA SCCT              | NG/FO       | 11,700                | 5                            | 10                           | 4%               | 4%                 | 800                         | 85                       | 83  | 83  | 78  | 74  | 72  | 72  | 72  | 74  | 78  | 83  | 85      | Sep-Apr            |
| 7FA SCCT              | NG/FO       | 10,500                | 5                            | 8                            | 4%               | 4%                 | 750                         | 172                      | 167 | 167 | 157 | 151 | 145 | 145 | 145 | 151 | 157 | 167 | 172     | Sep-Apr            |
| Stoker Coal Boiler    | Coal        | 12,000                | 8                            | 80                           | 6%               | 4%                 | 4,000                       | 50                       | 50  | 50  | 50  | 50  | 50  | 50  | 50  | 50  | 50  | 50  | 50      | May-Aug            |
| PC Coal Boiler        | Coal        | 11,000                | 7                            | 60                           | 8%               | 4%                 | 3,000                       | 100                      | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100     | May-Aug            |
| PC Reheat Coal Boiler | Coal        | 10,000                | 6                            | 45                           | 8%               | 4%                 | 2,420                       | 150                      | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150     | May-Aug            |

\*CCCT=Combined Cycle Combustion Turbine, SCCT=Simple Cycle Combustion Turbine, PC=Pulverized Coal. Names LM2500, 6B, etc. are model names.

\*\*NG/FO=Natural Gas/Fuel Oil

Table B.3(b)  
Fire Island Monthly Capacity Factors

| Month:                              | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   |
|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Average Capacity Factor (%):</b> | 39.7% | 35.3% | 34.8% | 29.4% | 23.4% | 30.4% | 26.2% | 24.7% | 34.5% | 41.1% | 36.0% | 34.3% |



## Appendix B.4 Load Data

Monthly load shapes by area, with 2004 expected annual energy requirements (aMW) are presented in Table B.4(a). Block Load Duration Curve (BLDC) data, similar to that exhibited in Figure 3-3, is presented in Table B.4(b) for each month of the year.

Table B.4(a)  
Monthly Load Shapes by Area, with 2004 Expected Annual Energy Requirements (aMW)

| <b>Month</b> | <b>Fairbanks</b> | <b>Anchorage</b> | <b>Kenai</b> |
|--------------|------------------|------------------|--------------|
| Jan          | 163              | 391              | 71           |
| Feb          | 159              | 378              | 68           |
| Mar          | 142              | 349              | 64           |
| Apr          | 140              | 324              | 61           |
| May          | 133              | 303              | 58           |
| Jun          | 132              | 301              | 60           |
| Jul          | 129              | 296              | 64           |
| Aug          | 133              | 302              | 62           |
| Sep          | 135              | 313              | 58           |
| Oct          | 137              | 332              | 63           |
| Nov          | 156              | 364              | 68           |
| Dec          | 172              | 390              | 73           |

Table B.4(b)  
Block Load Duration Curves by Area, with 2004 Expected Annual Energy Requirements  
(aMW)

| Month | Hour Block | Fairbanks | Anchorage | Kenai | Total | # of Hours in Block |
|-------|------------|-----------|-----------|-------|-------|---------------------|
| 1     | 1          | 179       | 466       | 81    | 727   | 110                 |
| 1     | 2          | 172       | 429       | 76    | 676   | 295                 |
| 1     | 3          | 163       | 381       | 70    | 614   | 92                  |
| 1     | 4          | 148       | 339       | 64    | 551   | 102                 |
| 1     | 5          | 141       | 300       | 58    | 499   | 145                 |
| 2     | 1          | 174       | 441       | 77    | 692   | 111                 |
| 2     | 2          | 167       | 412       | 72    | 651   | 233                 |
| 2     | 3          | 160       | 374       | 67    | 600   | 114                 |
| 2     | 4          | 147       | 331       | 60    | 538   | 78                  |
| 2     | 5          | 139       | 298       | 56    | 493   | 136                 |
| 3     | 1          | 161       | 423       | 75    | 659   | 20                  |
| 3     | 2          | 151       | 389       | 70    | 610   | 284                 |
| 3     | 3          | 145       | 356       | 65    | 566   | 156                 |
| 3     | 4          | 137       | 323       | 60    | 521   | 110                 |
| 3     | 5          | 127       | 288       | 56    | 471   | 174                 |
| 4     | 1          | 151       | 366       | 67    | 584   | 241                 |
| 4     | 2          | 114       | 353       | 66    | 534   | 15                  |
| 4     | 3          | 143       | 326       | 61    | 530   | 259                 |
| 4     | 4          | 116       | 310       | 62    | 488   | 2                   |
| 4     | 5          | 124       | 269       | 53    | 447   | 203                 |
| 5     | 1          | 147       | 356       | 65    | 569   | 229                 |
| 5     | 2          | 136       | 307       | 59    | 502   | 272                 |
| 5     | 3          | 124       | 264       | 53    | 441   | 91                  |
| 5     | 4          | 95        | 283       | 58    | 436   | 2                   |
| 5     | 5          | 113       | 238       | 49    | 401   | 150                 |
| 6     | 1          | 151       | 360       | 67    | 578   | 158                 |
| 6     | 2          | 123       | 360       | 65    | 549   | 27                  |
| 6     | 3          | 140       | 318       | 62    | 520   | 227                 |
| 6     | 4          | 128       | 279       | 57    | 464   | 111                 |
| 6     | 5          | 113       | 240       | 51    | 404   | 197                 |
| 7     | 1          | 146       | 359       | 71    | 576   | 144                 |
| 7     | 2          | 140       | 335       | 69    | 544   | 104                 |
| 7     | 3          | 133       | 302       | 66    | 501   | 193                 |
| 7     | 4          | 121       | 266       | 60    | 447   | 138                 |
| 7     | 5          | 108       | 233       | 55    | 396   | 165                 |
| 8     | 1          | 145       | 355       | 69    | 569   | 214                 |
| 8     | 2          | 139       | 310       | 63    | 513   | 274                 |
| 8     | 3          | 110       | 325       | 64    | 499   | 4                   |
| 8     | 4          | 124       | 270       | 58    | 451   | 68                  |
| 8     | 5          | 114       | 240       | 53    | 406   | 184                 |
| 9     | 1          | 148       | 363       | 65    | 576   | 222                 |
| 9     | 2          | 121       | 360       | 64    | 546   | 13                  |
| 9     | 3          | 143       | 328       | 60    | 531   | 198                 |
| 9     | 4          | 131       | 294       | 55    | 479   | 81                  |
| 9     | 5          | 118       | 247       | 48    | 413   | 206                 |
| 10    | 1          | 163       | 416       | 77    | 655   | 11                  |
| 10    | 2          | 148       | 377       | 69    | 594   | 326                 |
| 10    | 3          | 142       | 339       | 65    | 546   | 146                 |
| 10    | 4          | 129       | 301       | 58    | 488   | 67                  |
| 10    | 5          | 118       | 258       | 52    | 428   | 194                 |
| 11    | 1          | 180       | 448       | 78    | 707   | 67                  |
| 11    | 2          | 171       | 417       | 75    | 663   | 172                 |
| 11    | 3          | 160       | 388       | 73    | 621   | 163                 |
| 11    | 4          | 152       | 348       | 66    | 567   | 108                 |
| 11    | 5          | 133       | 285       | 58    | 475   | 210                 |
| 12    | 1          | 193       | 476       | 84    | 754   | 72                  |
| 12    | 2          | 188       | 443       | 80    | 712   | 185                 |
| 12    | 3          | 178       | 410       | 76    | 664   | 184                 |
| 12    | 4          | 164       | 359       | 69    | 592   | 116                 |
| 12    | 5          | 145       | 301       | 61    | 507   | 187                 |

## Appendix B.5 Fuel Price Data

Comprehensive data regarding fuel prices are provided in Tables B.5(a) through B.5(f).

Table B.5(a)  
 Projected Henry Hub Natural Gas Prices, by Scenario (2003 \$ / MMBtu)

| Year | Confidence Interval |     |     |     |      |
|------|---------------------|-----|-----|-----|------|
|      | 10%                 | 30% | 50% | 70% | 90%  |
| 2008 | 2.9                 | 3.7 | 4.4 | 5.2 | 6.7  |
| 2009 | 2.5                 | 3.3 | 4.0 | 4.8 | 6.3  |
| 2010 | 2.5                 | 3.4 | 4.2 | 5.1 | 6.9  |
| 2011 | 2.5                 | 3.4 | 4.3 | 5.4 | 7.4  |
| 2012 | 2.5                 | 3.4 | 4.4 | 5.5 | 7.8  |
| 2013 | 2.4                 | 3.4 | 4.4 | 5.7 | 8.1  |
| 2014 | 2.3                 | 3.4 | 4.4 | 5.8 | 8.4  |
| 2015 | 2.3                 | 3.4 | 4.5 | 5.9 | 8.7  |
| 2016 | 2.2                 | 3.3 | 4.4 | 5.8 | 8.8  |
| 2017 | 2.1                 | 3.2 | 4.3 | 5.8 | 8.9  |
| 2018 | 2.0                 | 3.2 | 4.3 | 5.8 | 9.1  |
| 2019 | 2.0                 | 3.1 | 4.3 | 5.9 | 9.3  |
| 2020 | 1.9                 | 3.1 | 4.3 | 5.9 | 9.5  |
| 2021 | 1.9                 | 3.1 | 4.3 | 6.0 | 9.7  |
| 2022 | 1.9                 | 3.0 | 4.3 | 6.0 | 9.9  |
| 2023 | 1.8                 | 3.0 | 4.3 | 6.1 | 10.1 |
| 2024 | 1.8                 | 3.0 | 4.3 | 6.1 | 10.3 |
| 2025 | 1.7                 | 3.0 | 4.3 | 6.2 | 10.6 |
| 2026 | 1.7                 | 2.9 | 4.3 | 6.3 | 10.8 |
| 2027 | 1.7                 | 2.9 | 4.3 | 6.3 | 11.0 |
| 2028 | 1.6                 | 2.9 | 4.3 | 6.4 | 11.2 |
| 2029 | 1.6                 | 2.9 | 4.3 | 6.4 | 11.4 |
| 2030 | 1.6                 | 2.9 | 4.3 | 6.5 | 11.7 |
| 2031 | 1.6                 | 2.8 | 4.3 | 6.5 | 11.9 |
| 2032 | 1.5                 | 2.8 | 4.3 | 6.6 | 12.1 |
| 2033 | 1.5                 | 2.8 | 4.3 | 6.6 | 12.3 |

Table B.5(b)  
 Projected Natural Gas Prices Paid by Alaska Power Plants, by Scenario (2003 \$ / MMBtu)

| Year | Confidence Interval |     |     |     |      |
|------|---------------------|-----|-----|-----|------|
|      | 10%                 | 30% | 50% | 70% | 90%  |
| 2008 | 1.5                 | 1.8 | 2.0 | 2.3 | 2.7  |
| 2009 | 1.6                 | 1.9 | 2.2 | 2.6 | 3.2  |
| 2010 | 1.8                 | 2.2 | 2.6 | 3.1 | 4.0  |
| 2011 | 1.9                 | 2.5 | 3.0 | 3.7 | 4.8  |
| 2012 | 2.0                 | 2.7 | 3.4 | 4.2 | 5.7  |
| 2013 | 2.1                 | 3.0 | 3.8 | 4.7 | 6.7  |
| 2014 | 2.2                 | 3.2 | 4.1 | 5.3 | 7.7  |
| 2015 | 2.3                 | 3.4 | 4.5 | 5.9 | 8.7  |
| 2016 | 2.2                 | 3.3 | 4.4 | 5.8 | 8.8  |
| 2017 | 2.1                 | 3.2 | 4.3 | 5.8 | 8.9  |
| 2018 | 2.0                 | 3.2 | 4.3 | 5.8 | 9.1  |
| 2019 | 2.0                 | 3.1 | 4.3 | 5.9 | 9.3  |
| 2020 | 1.9                 | 3.1 | 4.3 | 5.9 | 9.5  |
| 2021 | 1.9                 | 3.1 | 4.3 | 6.0 | 9.7  |
| 2022 | 1.9                 | 3.0 | 4.3 | 6.0 | 9.9  |
| 2023 | 1.8                 | 3.0 | 4.3 | 6.1 | 10.1 |
| 2024 | 1.8                 | 3.0 | 4.3 | 6.1 | 10.3 |
| 2025 | 1.7                 | 3.0 | 4.3 | 6.2 | 10.6 |
| 2026 | 1.7                 | 2.9 | 4.3 | 6.3 | 10.8 |
| 2027 | 1.7                 | 2.9 | 4.3 | 6.3 | 11.0 |
| 2028 | 1.6                 | 2.9 | 4.3 | 6.4 | 11.2 |
| 2029 | 1.6                 | 2.9 | 4.3 | 6.4 | 11.4 |
| 2030 | 1.6                 | 2.9 | 4.3 | 6.5 | 11.7 |
| 2031 | 1.6                 | 2.8 | 4.3 | 6.5 | 11.9 |
| 2032 | 1.5                 | 2.8 | 4.3 | 6.6 | 12.1 |
| 2033 | 1.5                 | 2.8 | 4.3 | 6.6 | 12.3 |

Table B.5(c)  
 Projected World Oil Prices, by Scenario (2003 \$ / Barrel)

| Year | Confidence Interval |      |      |      |      |
|------|---------------------|------|------|------|------|
|      | 10%                 | 30%  | 50%  | 70%  | 90%  |
| 2008 | 19.3                | 22.3 | 24.4 | 26.5 | 29.5 |
| 2009 | 19.5                | 22.5 | 24.5 | 26.6 | 29.6 |
| 2010 | 19.6                | 22.6 | 24.7 | 26.8 | 29.7 |
| 2011 | 19.8                | 22.8 | 24.8 | 26.9 | 29.9 |
| 2012 | 19.9                | 22.9 | 25.0 | 27.1 | 30.0 |
| 2013 | 20.1                | 23.1 | 25.1 | 27.2 | 30.2 |
| 2014 | 20.2                | 23.2 | 25.3 | 27.4 | 30.3 |
| 2015 | 20.4                | 23.4 | 25.4 | 27.5 | 30.5 |
| 2016 | 20.5                | 23.5 | 25.6 | 27.7 | 30.7 |
| 2017 | 20.7                | 23.7 | 25.7 | 27.8 | 30.8 |
| 2018 | 20.8                | 23.8 | 25.9 | 28.0 | 31.0 |
| 2019 | 21.0                | 24.0 | 26.1 | 28.1 | 31.1 |
| 2020 | 21.2                | 24.1 | 26.2 | 28.3 | 31.3 |
| 2021 | 21.4                | 24.4 | 26.4 | 28.5 | 31.5 |
| 2022 | 21.6                | 24.6 | 26.7 | 28.7 | 31.7 |
| 2023 | 21.8                | 24.8 | 26.9 | 29.0 | 32.0 |
| 2024 | 22.1                | 25.0 | 27.1 | 29.2 | 32.2 |
| 2025 | 22.3                | 25.3 | 27.3 | 29.4 | 32.4 |
| 2026 | 22.5                | 25.5 | 27.6 | 29.6 | 32.6 |
| 2027 | 22.7                | 25.7 | 27.8 | 29.9 | 32.8 |
| 2028 | 22.9                | 25.9 | 28.0 | 30.1 | 33.1 |
| 2029 | 23.2                | 26.2 | 28.2 | 30.3 | 33.3 |
| 2030 | 23.4                | 26.4 | 28.5 | 30.5 | 33.5 |
| 2031 | 23.6                | 26.6 | 28.7 | 30.8 | 33.7 |
| 2032 | 23.8                | 26.8 | 28.9 | 31.0 | 34.0 |
| 2033 | 24.1                | 27.1 | 29.1 | 31.2 | 34.2 |

Table B.5(d)  
 Projected Diesel Prices, by Scenario (2003 \$ / MMBtu)

| Year | Confidence Interval |     |     |     |     |
|------|---------------------|-----|-----|-----|-----|
|      | 10%                 | 30% | 50% | 70% | 90% |
| 2008 | 6.6                 | 7.0 | 7.3 | 7.6 | 8.1 |
| 2009 | 6.6                 | 7.1 | 7.4 | 7.7 | 8.1 |
| 2010 | 6.6                 | 7.1 | 7.4 | 7.7 | 8.1 |
| 2011 | 6.7                 | 7.1 | 7.4 | 7.7 | 8.1 |
| 2012 | 6.7                 | 7.1 | 7.4 | 7.7 | 8.1 |
| 2013 | 6.7                 | 7.1 | 7.4 | 7.7 | 8.2 |
| 2014 | 6.7                 | 7.2 | 7.5 | 7.8 | 8.2 |
| 2015 | 6.8                 | 7.2 | 7.5 | 7.8 | 8.2 |
| 2016 | 6.8                 | 7.2 | 7.5 | 7.8 | 8.2 |
| 2017 | 6.8                 | 7.2 | 7.5 | 7.8 | 8.3 |
| 2018 | 6.8                 | 7.3 | 7.5 | 7.8 | 8.3 |
| 2019 | 6.8                 | 7.3 | 7.6 | 7.9 | 8.3 |
| 2020 | 6.9                 | 7.3 | 7.6 | 7.9 | 8.3 |
| 2021 | 6.9                 | 7.3 | 7.6 | 7.9 | 8.4 |
| 2022 | 6.9                 | 7.4 | 7.7 | 8.0 | 8.4 |
| 2023 | 7.0                 | 7.4 | 7.7 | 8.0 | 8.4 |
| 2024 | 7.0                 | 7.4 | 7.7 | 8.0 | 8.4 |
| 2025 | 7.0                 | 7.5 | 7.8 | 8.1 | 8.5 |
| 2026 | 7.1                 | 7.5 | 7.8 | 8.1 | 8.5 |
| 2027 | 7.1                 | 7.5 | 7.8 | 8.1 | 8.5 |
| 2028 | 7.1                 | 7.6 | 7.8 | 8.1 | 8.6 |
| 2029 | 7.2                 | 7.6 | 7.9 | 8.2 | 8.6 |
| 2030 | 7.2                 | 7.6 | 7.9 | 8.2 | 8.6 |
| 2031 | 7.2                 | 7.6 | 7.9 | 8.2 | 8.7 |
| 2032 | 7.3                 | 7.7 | 8.0 | 8.3 | 8.7 |
| 2033 | 7.3                 | 7.7 | 8.0 | 8.3 | 8.7 |

Table B.5(e)  
 Projected HAGO Prices, by Scenario (2003 \$ / MMBtu)

| Year | Confidence Interval |     |     |     |     |
|------|---------------------|-----|-----|-----|-----|
|      | 10%                 | 30% | 50% | 70% | 90% |
| 2008 | 3.4                 | 3.9 | 4.2 | 4.5 | 5.0 |
| 2009 | 3.4                 | 3.9 | 4.2 | 4.6 | 5.1 |
| 2010 | 3.4                 | 3.9 | 4.3 | 4.6 | 5.1 |
| 2011 | 3.5                 | 3.9 | 4.3 | 4.6 | 5.1 |
| 2012 | 3.5                 | 4.0 | 4.3 | 4.6 | 5.1 |
| 2013 | 3.5                 | 4.0 | 4.3 | 4.7 | 5.2 |
| 2014 | 3.5                 | 4.0 | 4.4 | 4.7 | 5.2 |
| 2015 | 3.6                 | 4.0 | 4.4 | 4.7 | 5.2 |
| 2016 | 3.6                 | 4.1 | 4.4 | 4.7 | 5.2 |
| 2017 | 3.6                 | 4.1 | 4.4 | 4.8 | 5.3 |
| 2018 | 3.6                 | 4.1 | 4.5 | 4.8 | 5.3 |
| 2019 | 3.7                 | 4.1 | 4.5 | 4.8 | 5.3 |
| 2020 | 3.7                 | 4.2 | 4.5 | 4.8 | 5.3 |
| 2021 | 3.7                 | 4.2 | 4.5 | 4.9 | 5.4 |
| 2022 | 3.8                 | 4.2 | 4.6 | 4.9 | 5.4 |
| 2023 | 3.8                 | 4.3 | 4.6 | 5.0 | 5.4 |
| 2024 | 3.8                 | 4.3 | 4.7 | 5.0 | 5.5 |
| 2025 | 3.9                 | 4.4 | 4.7 | 5.0 | 5.5 |
| 2026 | 3.9                 | 4.4 | 4.7 | 5.1 | 5.6 |
| 2027 | 3.9                 | 4.4 | 4.8 | 5.1 | 5.6 |
| 2028 | 4.0                 | 4.5 | 4.8 | 5.1 | 5.6 |
| 2029 | 4.0                 | 4.5 | 4.8 | 5.2 | 5.7 |
| 2030 | 4.0                 | 4.5 | 4.9 | 5.2 | 5.7 |
| 2031 | 4.1                 | 4.6 | 4.9 | 5.2 | 5.7 |
| 2032 | 4.1                 | 4.6 | 4.9 | 5.3 | 5.8 |
| 2033 | 4.2                 | 4.6 | 5.0 | 5.3 | 5.8 |

Table B.5(f)  
 Projected Naptha Prices, by Scenario (2003 \$ / MMBtu)

| Year | Confidence Interval |     |     |     |     |
|------|---------------------|-----|-----|-----|-----|
|      | 10%                 | 30% | 50% | 70% | 90% |
| 2008 | 4.2                 | 4.8 | 5.2 | 5.6 | 6.2 |
| 2009 | 4.2                 | 4.8 | 5.2 | 5.7 | 6.3 |
| 2010 | 4.2                 | 4.8 | 5.3 | 5.7 | 6.3 |
| 2011 | 4.3                 | 4.9 | 5.3 | 5.7 | 6.3 |
| 2012 | 4.3                 | 4.9 | 5.3 | 5.7 | 6.4 |
| 2013 | 4.3                 | 4.9 | 5.4 | 5.8 | 6.4 |
| 2014 | 4.4                 | 5.0 | 5.4 | 5.8 | 6.4 |
| 2015 | 4.4                 | 5.0 | 5.4 | 5.8 | 6.4 |
| 2016 | 4.4                 | 5.0 | 5.4 | 5.9 | 6.5 |
| 2017 | 4.5                 | 5.1 | 5.5 | 5.9 | 6.5 |
| 2018 | 4.5                 | 5.1 | 5.5 | 5.9 | 6.5 |
| 2019 | 4.5                 | 5.1 | 5.5 | 6.0 | 6.6 |
| 2020 | 4.6                 | 5.2 | 5.6 | 6.0 | 6.6 |
| 2021 | 4.6                 | 5.2 | 5.6 | 6.0 | 6.6 |
| 2022 | 4.6                 | 5.2 | 5.7 | 6.1 | 6.7 |
| 2023 | 4.7                 | 5.3 | 5.7 | 6.1 | 6.7 |
| 2024 | 4.7                 | 5.3 | 5.8 | 6.2 | 6.8 |
| 2025 | 4.8                 | 5.4 | 5.8 | 6.2 | 6.8 |
| 2026 | 4.8                 | 5.4 | 5.8 | 6.3 | 6.9 |
| 2027 | 4.9                 | 5.5 | 5.9 | 6.3 | 6.9 |
| 2028 | 4.9                 | 5.5 | 5.9 | 6.4 | 7.0 |
| 2029 | 5.0                 | 5.6 | 6.0 | 6.4 | 7.0 |
| 2030 | 5.0                 | 5.6 | 6.0 | 6.4 | 7.1 |
| 2031 | 5.0                 | 5.7 | 6.1 | 6.5 | 7.1 |
| 2032 | 5.1                 | 5.7 | 6.1 | 6.5 | 7.1 |
| 2033 | 5.1                 | 5.7 | 6.2 | 6.6 | 7.2 |



# Appendix C

## Detailed Results

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Appendix C contains detailed results for the Dispatch and Cost Regression Sub-Modules, the Retirement analysis, and Reliability analysis. Supporting data for the capacity requirements by load scenario charts and the investment strategies tables are also provided.

### Appendix C.1 Dispatch Cost Results

The Dispatch Sub-Module encompassed fifty random draws for each of the 26 years of the study period. The sub-module was executed for more than 30,000 distinct portfolios, each comprising a combination of new unit additions. Table C.1 displays the results for one of these evaluated portfolios—the Base Case with no new additions.

Table C.1  
 Dispatch Sub-Module Results, Base Case No New Additions Portfolio (Millions \$)

| Draw: | 2008 | 2009 | 2010 | 2011 | 2012 | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  | 2025  | 2026  | 2027  | 2028  | 2029  | 2030  | 2031  | 2032  | 2033  |
|-------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1     | 198  | 254  | 337  | 549  | 746  | 862   | 1,076 | 1,256 | 1,199 | 1,327 | 1,285 | 1,339 | 1,788 | 1,784 | 2,288 | 2,162 | 2,929 | 3,001 | 3,073 | 3,213 | 3,458 | 3,448 | 3,297 | 3,779 | 4,036 | 4,661 |
| 2     | 116  | 129  | 135  | 163  | 186  | 224   | 160   | 138   | 174   | 180   | 192   | 245   | 192   | 359   | 412   | 478   | 938   | 937   | 896   | 968   | 1,012 | 1,233 | 1,385 | 1,354 | 1,355 | 1,473 |
| 3     | 195  | 221  | 277  | 316  | 310  | 331   | 462   | 479   | 531   | 669   | 972   | 1,519 | 1,874 | 2,520 | 2,688 | 2,964 | 3,945 | 3,731 | 3,713 | 4,243 | 3,906 | 3,983 | 4,130 | 5,040 | 5,604 | 6,090 |
| 4     | 242  | 263  | 266  | 318  | 342  | 567   | 568   | 588   | 687   | 747   | 910   | 1,153 | 1,820 | 2,792 | 3,444 | 3,525 | 4,284 | 4,459 | 4,839 | 5,057 | 5,192 | 5,358 | 5,939 | 6,293 | 6,401 | 6,861 |
| 5     | 138  | 141  | 199  | 253  | 226  | 274   | 374   | 384   | 438   | 566   | 656   | 651   | 769   | 1,072 | 1,377 | 1,439 | 2,034 | 2,044 | 1,901 | 2,200 | 2,380 | 2,762 | 2,539 | 2,689 | 3,314 | 3,255 |
| 6     | 140  | 136  | 177  | 276  | 363  | 464   | 532   | 685   | 833   | 816   | 1,024 | 1,255 | 1,127 | 1,723 | 2,232 | 2,210 | 3,528 | 3,430 | 3,472 | 3,827 | 3,923 | 3,905 | 3,736 | 4,423 | 4,388 | 4,331 |
| 7     | 134  | 139  | 150  | 144  | 173  | 166   | 196   | 262   | 282   | 206   | 201   | 227   | 818   | 987   | 1,248 | 2,192 | 2,664 | 2,568 | 2,703 | 2,737 | 2,934 | 2,856 | 3,106 | 3,417 | 3,586 |       |
| 8     | 100  | 146  | 195  | 240  | 302  | 405   | 531   | 548   | 698   | 742   | 1,033 | 1,391 | 2,027 | 2,327 | 1,574 | 1,947 | 2,499 | 2,376 | 2,423 | 2,425 | 2,594 | 2,813 | 3,071 | 3,145 | 3,388 | 3,726 |
| 9     | 147  | 141  | 138  | 161  | 147  | 182   | 202   | 256   | 321   | 480   | 557   | 868   | 862   | 1,034 | 1,248 | 1,416 | 1,992 | 1,839 | 1,940 | 2,088 | 2,214 | 2,313 | 2,507 | 2,715 | 2,886 | 2,952 |
| 10    | 184  | 281  | 364  | 308  | 373  | 523   | 521   | 550   | 502   | 632   | 551   | 516   | 478   | 784   | 880   | 1,178 | 1,909 | 2,005 | 2,082 | 2,268 | 2,579 | 3,007 | 3,007 | 3,751 | 4,074 | 4,495 |
| 11    | 169  | 204  | 277  | 358  | 332  | 303   | 431   | 454   | 753   | 599   | 552   | 673   | 987   | 1,393 | 1,737 | 2,342 | 3,094 | 3,169 | 3,266 | 3,561 | 3,788 | 4,200 | 4,428 | 4,424 | 4,443 | 4,819 |
| 12    | 139  | 121  | 130  | 122  | 144  | 175   | 196   | 177   | 211   | 210   | 324   | 382   | 414   | 440   | 469   | 418   | 1,086 | 1,523 | 1,545 | 1,853 | 2,348 | 2,340 | 2,574 | 2,959 | 3,124 | 3,639 |
| 13    | 189  | 192  | 262  | 256  | 313  | 414   | 489   | 628   | 686   | 707   | 654   | 690   | 593   | 812   | 804   | 970   | 1,566 | 1,827 | 2,203 | 1,844 | 1,919 | 2,338 | 2,681 | 2,790 | 2,531 | 2,427 |
| 14    | 169  | 176  | 173  | 207  | 229  | 248   | 233   | 245   | 245   | 280   | 348   | 321   | 384   | 744   | 793   | 852   | 1,469 | 1,806 | 2,132 | 2,327 | 2,294 | 2,521 | 2,591 | 2,798 | 2,831 | 2,879 |
| 15    | 145  | 149  | 190  | 198  | 217  | 226   | 249   | 255   | 274   | 288   | 281   | 294   | 293   | 426   | 412   | 370   | 945   | 973   | 945   | 965   | 1,010 | 1,017 | 1,183 | 1,138 | 1,132 | 1,148 |
| 16    | 162  | 159  | 163  | 240  | 319  | 533   | 639   | 640   | 770   | 728   | 692   | 628   | 783   | 1,164 | 1,251 | 1,515 | 2,469 | 2,706 | 2,677 | 2,868 | 3,146 | 2,865 | 3,349 | 3,620 | 4,050 | 4,110 |
| 17    | 167  | 206  | 202  | 256  | 250  | 291   | 334   | 361   | 386   | 336   | 279   | 262   | 332   | 619   | 873   | 825   | 1,519 | 1,521 | 1,508 | 1,288 | 1,373 | 1,357 | 1,325 | 1,554 | 1,809 | 1,909 |
| 18    | 118  | 138  | 201  | 180  | 236  | 307   | 379   | 562   | 570   | 663   | 812   | 917   | 1,349 | 1,850 | 1,902 | 1,942 | 3,024 | 3,092 | 2,886 | 3,044 | 3,016 | 2,897 | 2,977 | 2,963 | 3,451 | 3,465 |
| 19    | 150  | 157  | 198  | 239  | 238  | 288   | 309   | 294   | 299   | 233   | 220   | 267   | 317   | 530   | 673   | 650   | 1,443 | 1,743 | 2,199 | 2,044 | 2,275 | 2,567 | 3,288 | 3,155 | 3,450 | 3,608 |
| 20    | 117  | 146  | 117  | 141  | 127  | 146   | 152   | 154   | 159   | 139   | 156   | 128   | 152   | 272   | 248   | 272   | 798   | 914   | 1,016 | 1,427 | 1,422 | 1,760 | 1,836 | 1,829 | 1,782 | 1,856 |
| 21    | 150  | 180  | 212  | 237  | 282  | 312   | 370   | 412   | 516   | 520   | 548   | 567   | 553   | 863   | 1,447 | 1,643 | 1,872 | 1,968 | 1,852 | 1,944 | 2,481 | 2,484 | 2,485 | 3,205 | 4,067 | 4,053 |
| 22    | 124  | 109  | 113  | 92   | 101  | 103   | 95    | 108   | 104   | 87    | 84    | 103   | 111   | 506   | 793   | 923   | 1,908 | 1,924 | 2,144 | 2,334 | 2,559 | 2,938 | 2,937 | 3,216 | 3,528 | 3,783 |
| 23    | 156  | 156  | 168  | 186  | 205  | 176   | 190   | 219   | 228   | 214   | 233   | 204   | 239   | 578   | 593   | 873   | 1,822 | 1,944 | 2,045 | 2,271 | 2,565 | 2,977 | 3,161 | 3,026 | 3,166 | 3,273 |
| 24    | 175  | 229  | 254  | 293  | 449  | 437   | 492   | 550   | 750   | 837   | 481   | 645   | 850   | 1,320 | 1,227 | 1,372 | 2,486 | 2,779 | 3,006 | 3,140 | 3,428 | 3,514 | 3,686 | 3,577 | 3,561 | 3,856 |
| 25    | 157  | 186  | 187  | 212  | 243  | 304   | 340   | 308   | 380   | 319   | 356   | 360   | 441   | 734   | 838   | 873   | 1,361 | 1,754 | 1,958 | 2,127 | 2,250 | 2,243 | 2,279 | 2,346 | 2,481 | 2,858 |
| 26    | 119  | 127  | 143  | 179  | 305  | 359   | 491   | 848   | 1,036 | 769   | 995   | 1,071 | 1,055 | 1,446 | 1,613 | 1,800 | 2,941 | 3,081 | 2,863 | 3,023 | 3,874 | 4,262 | 4,883 | 5,290 | 5,973 | 5,952 |
| 27    | 144  | 159  | 198  | 191  | 207  | 288   | 271   | 271   | 317   | 260   | 257   | 304   | 319   | 585   | 596   | 662   | 1,170 | 920   | 981   | 1,088 | 1,243 | 1,483 | 1,395 | 1,683 | 1,607 | 1,923 |
| 28    | 154  | 199  | 314  | 435  | 811  | 1,072 | 1,746 | 2,353 | 2,900 | 3,527 | 3,703 | 4,015 | 3,925 | 4,585 | 4,635 | 4,997 | 5,007 | 4,905 | 5,075 | 4,945 | 4,578 | 4,902 | 5,076 | 5,166 | 5,493 | 6,019 |
| 29    | 171  | 138  | 159  | 158  | 179  | 285   | 345   | 385   | 640   | 623   | 899   | 808   | 1,030 | 1,026 | 1,206 | 1,249 | 2,002 | 2,086 | 2,556 | 2,767 | 2,796 | 2,784 | 3,117 | 3,550 | 3,893 | 4,278 |
| 30    | 149  | 160  | 137  | 146  | 151  | 143   | 163   | 154   | 166   | 159   | 218   | 306   | 467   | 656   | 754   | 895   | 1,560 | 1,857 | 2,095 | 2,342 | 2,645 | 2,692 | 2,902 | 3,075 | 2,939 | 3,208 |
| 31    | 168  | 251  | 332  | 369  | 373  | 557   | 617   | 771   | 924   | 865   | 1,364 | 1,569 | 1,632 | 2,004 | 2,292 | 2,189 | 3,106 | 3,631 | 3,659 | 3,564 | 3,620 | 3,892 | 4,055 | 4,027 | 4,591 | 4,755 |
| 32    | 142  | 143  | 156  | 166  | 227  | 225   | 343   | 551   | 591   | 562   | 854   | 1,147 | 1,451 | 2,003 | 2,098 | 2,382 | 3,192 | 3,315 | 3,928 | 4,126 | 4,557 | 4,538 | 4,809 | 5,386 | 5,058 | 5,617 |
| 33    | 125  | 147  | 178  | 215  | 401  | 296   | 570   | 816   | 512   | 447   | 329   | 346   | 403   | 858   | 1,013 | 1,402 | 2,600 | 2,539 | 3,068 | 2,971 | 3,167 | 3,585 | 3,714 | 4,167 | 4,503 | 4,589 |
| 34    | 235  | 187  | 215  | 223  | 278  | 315   | 304   | 283   | 226   | 180   | 183   | 204   | 297   | 796   | 813   | 827   | 1,727 | 1,836 | 1,875 | 2,008 | 2,195 | 2,204 | 2,449 | 2,661 | 3,020 | 3,327 |
| 35    | 127  | 151  | 173  | 178  | 207  | 241   | 247   | 218   | 235   | 210   | 247   | 297   | 406   | 636   | 869   | 995   | 2,057 | 2,035 | 2,266 | 2,457 | 2,841 | 3,072 | 2,780 | 2,997 | 3,420 | 4,164 |
| 36    | 175  | 234  | 371  | 638  | 962  | 1,172 | 1,487 | 1,387 | 1,611 | 2,154 | 1,900 | 1,726 | 1,982 | 2,171 | 2,711 | 2,364 | 3,426 | 3,460 | 3,485 | 3,454 | 3,226 | 3,466 | 3,544 | 3,791 | 4,027 | 4,242 |
| 37    | 188  | 210  | 337  | 394  | 484  | 526   | 716   | 678   | 631   | 395   | 434   | 456   | 582   | 1,065 | 1,130 | 1,089 | 1,765 | 1,740 | 1,728 | 1,702 | 1,746 | 2,069 | 2,130 | 2,142 | 3,042 | 3,246 |
| 38    | 129  | 153  | 149  | 194  | 191  | 186   | 179   | 179   | 223   | 239   | 267   | 433   | 402   | 794   | 857   | 743   | 1,485 | 1,504 | 1,596 | 1,705 | 2,010 | 2,118 | 2,353 | 2,394 | 2,554 | 2,604 |
| 39    | 180  | 225  | 225  | 308  | 343  | 404   | 549   | 702   | 786   | 1,018 | 925   | 848   | 1,375 | 2,202 | 2,202 | 2,258 | 3,291 | 3,398 | 3,387 | 3,247 | 3,352 | 3,713 | 3,915 | 4,258 | 4,469 | 4,823 |
| 40    | 162  | 188  | 194  | 201  | 218  | 270   | 291   | 307   | 365   | 329   | 442   | 448   | 456   | 862   | 1,106 | 1,300 | 2,127 | 2,365 | 2,789 | 2,998 | 3,276 | 3,194 | 3,461 | 3,535 | 3,959 | 4,063 |
| 41    | 151  | 118  | 251  | 299  | 304  | 307   | 314   | 322   | 318   | 279   | 364   | 371   | 740   | 1,378 | 1,262 | 1,278 | 1,813 | 1,919 | 1,849 | 1,825 | 1,857 | 2,078 | 2,062 | 2,218 | 2,039 | 2,336 |
| 42    | 300  | 253  | 319  | 369  | 359  | 546   | 581   | 629   | 621   | 565   | 568   | 747   | 988   | 1,457 | 1,595 | 1,786 | 2,274 | 2,426 | 2,431 | 2,878 | 2,801 | 2,983 | 3,094 | 3,468 | 3,379 | 3,558 |
| 43    | 131  | 170  | 180  | 193  | 245  | 277   | 303   | 465   | 548   | 459   | 360   | 351   | 525   | 1,113 | 1,421 | 1,569 | 2,548 | 2,643 | 2,664 | 3,043 | 3,351 | 3,026 | 3,214 | 3,166 | 3,227 | 3,671 |
| 44    | 130  | 177  | 207  | 255  | 317  | 442   | 609   | 435   | 503   | 362   | 404   | 597   | 1,236 | 1,435 | 1,603 | 2,497 | 2,742 | 2,996 | 3,374 | 3,465 | 3,680 | 4,063 | 3,882 | 3,544 | 4,138 |       |
| 45    | 159  | 221  | 279  | 241  | 301  | 289   | 316   | 353   | 609   | 577   | 548   | 529   | 595   | 998   | 1,110 | 1,113 | 2,010 | 2,238 | 2,412 | 2,661 | 2,982 | 2,909 | 2,914 | 2,941 | 3,355 | 3,768 |
| 46    | 173  | 289  | 275  | 287  | 340  | 516   | 430   | 518   | 510   | 303   | 253   | 220   | 466   | 916   | 1,053 | 1,303 | 2,014 | 2,018 | 2,004 | 2,174 | 2,115 | 2,152 | 1,962 | 2,148 | 2,248 | 2,198 |
| 47    | 150  | 161  | 202  | 203  | 253  | 292   | 308   | 280   | 262   | 259   | 248   | 282   | 321   | 426   | 431   | 479   | 841   | 1,049 | 1,059 | 1,228 | 1,451 | 1,491 | 1,731 | 1,771 | 1,564 | 1,522 |
| 48    | 155  | 146  | 166  | 168  | 179  | 186   | 271   | 422   | 582   | 438   | 339   | 525   | 316   | 715   | 650   | 729   | 1,502 | 1,588 | 1,680 | 1,920 | 2,060 | 2,132 | 2,255 | 2,267 | 2,382 | 2,677 |
| 49    | 147  | 125  | 166  | 186  | 187  | 260   | 357   | 348   | 557   | 569   | 618   | 928   | 1,330 | 2,035 | 2,198 | 2,156 | 3,126 | 3,708 | 3,747 | 3,890 | 3,913 | 4,156 | 4,122 | 4,414 | 4,866 | 5,718 |

## Appendix C.2 Dispatch Cost Regression

The Cost Regression Sub-Module was executed for more than 30,000 distinct portfolios, for each of the 26 years in the study period. The results for one of these portfolios are provided in Table C.2. The table can be interpreted as follows: In 2008, the cost for this portfolio (in millions of \$) is equal to  $-295.5 + (1.0 \times \text{Fairbanks Load}) + (.4 \times \text{Anchorage Load}) + (.2 \times \text{Kenai Load}) + (8.9 \times \text{Henry Hub Price}) + (0.0 \times \text{Total Hydro}) + (2.6 \times \text{World Oil Price})$ , where the three loads are expressed in aMW, the Henry Hub Price in \$ per MMBtu, the World Oil Price in \$ per barrel, and Total Hydro in GWh per year.

Table C.2  
Cost Regression Sub-Module Results, Base Case No New Additions Portfolio  
(Coefficients in Millions of \$ per Unit of Explanatory Variable)

| Year | Intercept | Fairbanks Load | Anchorage Load | Kenai Load | Henry Hub Price | Total Hydro | World Oil Price | Standard Error | R Square |
|------|-----------|----------------|----------------|------------|-----------------|-------------|-----------------|----------------|----------|
| 2008 | -295.5    | 1.0            | 0.4            | 0.2        | 8.9             | 0.0         | 2.6             | 17.0           | 0.789    |
| 2009 | -289.1    | 0.9            | 0.5            | 0.4        | 12.4            | -0.1        | 3.0             | 15.1           | 0.904    |
| 2010 | -263.9    | 0.8            | 0.5            | 0.3        | 16.3            | -0.1        | 2.3             | 10.8           | 0.979    |
| 2011 | -346.8    | 1.0            | 0.6            | 0.4        | 20.4            | 0.0         | 1.6             | 17.5           | 0.975    |
| 2012 | -388.0    | 1.5            | 0.6            | 0.2        | 25.5            | -0.1        | 2.3             | 34.0           | 0.962    |
| 2013 | -615.3    | 2.0            | 0.9            | 1.0        | 31.5            | -0.2        | 1.4             | 40.7           | 0.970    |
| 2014 | -666.0    | 2.3            | 0.9            | 0.0        | 36.2            | -0.2        | 4.7             | 49.3           | 0.978    |
| 2015 | -751.2    | 3.2            | 1.0            | 0.8        | 41.4            | -0.4        | 2.2             | 77.5           | 0.965    |
| 2016 | -1161.0   | 3.9            | 1.1            | 0.2        | 43.9            | 0.0         | 3.1             | 93.6           | 0.966    |
| 2017 | -1103.0   | 3.5            | 1.3            | 0.4        | 42.4            | 0.1         | 1.2             | 87.2           | 0.979    |
| 2018 | -909.3    | 4.0            | 1.3            | 0.1        | 42.7            | -0.3        | 1.0             | 94.7           | 0.980    |
| 2019 | -1756.1   | 4.8            | 1.5            | 0.1        | 40.8            | 0.5         | 5.6             | 96.4           | 0.982    |
| 2020 | -2235.0   | 5.1            | 3.3            | 1.8        | 45.8            | 0.0         | 0.8             | 112.3          | 0.979    |
| 2021 | -3894.0   | 6.9            | 6.3            | 5.0        | 35.4            | -0.2        | 8.3             | 156.3          | 0.968    |
| 2022 | -3380.9   | 7.0            | 6.6            | 5.5        | 33.0            | -0.7        | -0.9            | 196.6          | 0.955    |
| 2023 | -4170.0   | 6.9            | 7.1            | 6.4        | 38.4            | -0.2        | 3.0             | 146.5          | 0.976    |
| 2024 | -4927.3   | 7.9            | 9.8            | 7.6        | 31.8            | -0.5        | 4.2             | 156.9          | 0.978    |
| 2025 | -4869.1   | 8.0            | 9.9            | 8.1        | 30.9            | -1.0        | 7.5             | 173.5          | 0.970    |
| 2026 | -5310.8   | 8.0            | 9.9            | 8.7        | 32.5            | -0.2        | 5.9             | 139.7          | 0.982    |
| 2027 | -4956.5   | 8.0            | 10.1           | 6.2        | 39.7            | -0.5        | 1.1             | 66.5           | 0.996    |
| 2028 | -4910.0   | 8.0            | 10.2           | 6.0        | 40.8            | -0.7        | 2.4             | 53.5           | 0.997    |
| 2029 | -4905.2   | 8.1            | 10.3           | 5.4        | 39.9            | -0.4        | -0.7            | 52.8           | 0.998    |
| 2030 | -5008.4   | 8.1            | 10.4           | 5.0        | 39.3            | -0.6        | 2.5             | 52.8           | 0.998    |
| 2031 | -4891.7   | 8.2            | 10.5           | 5.0        | 40.0            | -0.7        | 0.4             | 57.1           | 0.998    |
| 2032 | -4985.4   | 8.5            | 10.2           | 6.3        | 30.0            | -0.5        | 2.1             | 210.2          | 0.973    |
| 2033 | -5071.0   | 8.7            | 10.3           | 4.6        | 28.1            | 0.6         | -6.7            | 210.3          | 0.977    |



## Appendix C.3 Retirement Analysis Results

Details about the calculations used to conduct the Retirements analysis, results of which are shown in Table 4-1, are provided in Table C.3(a) and C.3(c).

Table C.3(a)  
Unit Characteristics Used in Retirements Analysis

| Existing Unit           |                   |                            |               |                     |                         |                        |                           |                               | Potential New Unit |                                  |                     |                         |                        |                           |                               |
|-------------------------|-------------------|----------------------------|---------------|---------------------|-------------------------|------------------------|---------------------------|-------------------------------|--------------------|----------------------------------|---------------------|-------------------------|------------------------|---------------------------|-------------------------------|
| Unit Name               | Fuel / Technology | Retirement Evaluation Year | Capacity (MW) | Heat Rate (Btu/kWh) | Variable O&M (\$ / MWh) | Fixed O&M (\$ / kW-yr) | Capital Cost (\$ / kW-yr) | Total Fixed Cost (\$ / kW-yr) | Unit Name          | Installed Capital Cost (\$ / kW) | Heat Rate (Btu/kWh) | Variable O&M (\$ / MWh) | Fixed O&M (\$ / kW-yr) | Capital Cost (\$ / kW-yr) | Total Fixed Cost (\$ / kW-yr) |
|                         |                   |                            |               |                     |                         |                        |                           |                               |                    |                                  |                     |                         |                        |                           |                               |
| International 1         | Gas CT            | 2008                       | 15.1          | 16,121              | 5.2                     | 9.7                    | 62.2                      | 71.9                          | LM2500 SCCT        | 1,244.5                          | 10,900              | 7.0                     | 21.5                   | 102.8                     | 124.3                         |
| International 2         | Gas CT            | 2008                       | 14.8          | 17,388              | 5.2                     | 9.7                    | 62.2                      | 71.9                          | LM2500 SCCT        | 1,244.5                          | 10,900              | 7.0                     | 21.5                   | 102.8                     | 124.3                         |
| Beluga Unit 1           | Gas CT            | 2009                       | 19.6          | 17,283              | 5.3                     | 15.1                   | 63.8                      | 78.9                          | LM2500 SCCT        | 1,275.7                          | 10,900              | 7.2                     | 22.0                   | 105.9                     | 128.0                         |
| Beluga Unit 2           | Gas CT            | 2009                       | 19.6          | 17,918              | 5.3                     | 15.1                   | 63.8                      | 78.9                          | LM2500 SCCT        | 1,275.7                          | 10,900              | 7.2                     | 22.0                   | 105.9                     | 128.0                         |
| Bernice Lake 3          | Gas CT            | 2010                       | 28.1          | 13,460              | 5.5                     | 9.8                    | 65.4                      | 75.2                          | LM2500 SCCT        | 1,307.6                          | 10,900              | 7.4                     | 22.6                   | 108.0                     | 130.6                         |
| Bernice Lake 4          | Gas CT            | 2012                       | 22.5          | 13,639              | 5.7                     | 10.6                   | 68.7                      | 79.3                          | LM2500 SCCT        | 1,373.7                          | 10,900              | 7.7                     | 23.7                   | 113.5                     | 137.2                         |
| International 3         | Gas CT            | 2012                       | 19.2          | 15,127              | 5.7                     | 9.9                    | 68.7                      | 78.6                          | LM2500 SCCT        | 1,373.7                          | 10,900              | 7.7                     | 23.7                   | 113.5                     | 137.2                         |
| Beluga Unit 3           | Gas CT            | 2014                       | 69.2          | 12,288              | 6.0                     | 13.0                   | 52.5                      | 65.4                          | 7EA SCCT           | 1,049.7                          | 11,700              | 6.6                     | 13.1                   | 84.6                      | 97.7                          |
| Beluga Unit 5           | Gas CT            | 2017                       | 72.9          | 12,538              | 6.5                     | 13.8                   | 56.5                      | 70.3                          | 7EA SCCT           | 1,130.4                          | 11,700              | 7.2                     | 14.1                   | 92.9                      | 107.1                         |
| Beluga Unit 6/8         | Gas CC            | 2020                       | 108.5         | 9,620               | 7.0                     | 18.5                   | 76.1                      | 94.6                          | 7EA CCCT           | 1,521.6                          | 7,500               | 6.3                     | 32.0                   | 122.6                     | 154.6                         |
| Beluga Unit 7/8         | Gas CC            | 2021                       | 108.5         | 9,884               | 7.2                     | 19.1                   | 78.0                      | 97.1                          | 7EA CCCT           | 1,559.7                          | 7,500               | 6.5                     | 32.8                   | 125.7                     | 158.4                         |
| Healy 1                 | Coal Steam        | 2024                       | 27.0          | 13,360              | 14.1                    | 282.3                  | 335.9                     | 618.3                         | Stoker Coal Boiler | 6,718.3                          | 12,000              | 14.2                    | 134.4                  | 558.4                     | 692.7                         |
| ML&P Plant2 Unit 7&6 CC | Gas CC            | 2024                       | 110.0         | 9,010               | 8.0                     | 47.0                   | 84.0                      | 131.0                         | 7EA CCCT           | 1,679.6                          | 7,500               | 7.0                     | 47.0                   | 135.4                     | 182.4                         |
| Nikiski                 | Gas CT            | 2024                       | 42.0          | 11,600              | 7.7                     | 12.6                   | 92.4                      | 105.0                         | LM2500 SCCT        | 1,847.5                          | 10,900              | 10.4                    | 31.9                   | 152.6                     | 184.6                         |
| North Pole 1            | HAGO CT           | 2030                       | 63.0          | 10,370              | 6.5                     | 20.6                   | 77.9                      | 98.6                          | 7EA SCCT           | 1,558.2                          | 11,700              | 9.9                     | 19.5                   | 125.6                     | 145.1                         |
| North Pole 2            | HAGO CT           | 2030                       | 65.0          | 9,869               | 6.5                     | 20.6                   | 77.9                      | 98.6                          | 7EA SCCT           | 1,558.2                          | 11,700              | 9.9                     | 19.5                   | 125.6                     | 145.1                         |

Table C.3(b)  
Annual Production Cost for Combinations of Capacity Factor and Fuel Price (Per kW of Capacity)

| Existing Unit       |        |       |                        |        |       |                      |        |       | Potential Replacement Unit |        |       |                        |        |       |                      |        |       |
|---------------------|--------|-------|------------------------|--------|-------|----------------------|--------|-------|----------------------------|--------|-------|------------------------|--------|-------|----------------------|--------|-------|
| Low Capacity Factor |        |       | Medium Capacity Factor |        |       | High Capacity Factor |        |       | Low Capacity Factor        |        |       | Medium Capacity Factor |        |       | High Capacity Factor |        |       |
| Gas Price           |        |       | Gas Price              |        |       | Gas Price            |        |       | Gas Price                  |        |       | Gas Price              |        |       | Gas Price            |        |       |
| Low                 | Medium | High  | Low                    | Medium | High  | Low                  | Medium | High  | Low                        | Medium | High  | Low                    | Medium | High  | Low                  | Medium | High  |
| 36                  | 42     | 47    | 73                     | 83     | 93    | 109                  | 125    | 140   | 28                         | 32     | 36    | 57                     | 64     | 72    | 85                   | 96     | 108   |
| 29                  | 36     | 51    | 57                     | 72     | 102   | 86                   | 108    | 153   | 21                         | 26     | 36    | 42                     | 52     | 72    | 62                   | 78     | 108   |
| 31                  | 39     | 55    | 61                     | 77     | 110   | 92                   | 116    | 165   | 21                         | 26     | 36    | 42                     | 52     | 72    | 62                   | 78     | 108   |
| 27                  | 37     | 55    | 55                     | 74     | 110   | 82                   | 111    | 165   | 19                         | 25     | 36    | 38                     | 50     | 73    | 57                   | 75     | 109   |
| 28                  | 38     | 57    | 57                     | 76     | 114   | 85                   | 115    | 171   | 19                         | 25     | 36    | 38                     | 50     | 73    | 57                   | 75     | 109   |
| 22                  | 34     | 49    | 44                     | 67     | 99    | 66                   | 101    | 148   | 19                         | 29     | 41    | 38                     | 57     | 83    | 58                   | 86     | 124   |
| 24                  | 35     | 54    | 47                     | 71     | 109   | 71                   | 106    | 163   | 20                         | 30     | 45    | 40                     | 59     | 90    | 61                   | 89     | 135   |
| 26                  | 39     | 60    | 52                     | 78     | 120   | 78                   | 117    | 181   | 20                         | 30     | 45    | 40                     | 59     | 90    | 61                   | 89     | 135   |
| 134                 | 200    | 326   | 179                    | 267    | 435   | 223                  | 334    | 544   | 130                        | 193    | 313   | 173                    | 257    | 418   | 217                  | 322    | 522   |
| 140                 | 207    | 365   | 186                    | 277    | 487   | 233                  | 346    | 609   | 133                        | 196    | 344   | 178                    | 262    | 458   | 222                  | 327    | 573   |
| 272                 | 429    | 673   | 310                    | 490    | 769   | 349                  | 551    | 865   | 217                        | 340    | 530   | 248                    | 388    | 606   | 279                  | 437    | 681   |
| 269                 | 455    | 783   | 307                    | 520    | 895   | 345                  | 585    | 1,007 | 210                        | 352    | 601   | 240                    | 402    | 687   | 270                  | 452    | 773   |
| 438                 | 697    | 1,200 | 501                    | 796    | 1,372 | 564                  | 896    | 1,543 | 403                        | 635    | 1,087 | 461                    | 726    | 1,243 | 518                  | 817    | 1,398 |
| 286                 | 461    | 800   | 327                    | 527    | 914   | 368                  | 592    | 1,029 | 240                        | 386    | 668   | 275                    | 441    | 764   | 309                  | 496    | 859   |
| 25                  | 41     | 72    | 50                     | 82     | 145   | 76                   | 124    | 217   | 25                         | 40     | 69    | 50                     | 80     | 139   | 75                   | 120    | 208   |
| 24                  | 42     | 74    | 47                     | 85     | 147   | 71                   | 127    | 221   | 28                         | 49     | 84    | 56                     | 98     | 168   | 83                   | 146    | 252   |
| 23                  | 40     | 70    | 45                     | 81     | 140   | 68                   | 121    | 210   | 28                         | 49     | 84    | 56                     | 98     | 168   | 83                   | 146    | 252   |

Table C.3(c)  
Differences—Existing Minus Potential Replacement

| Total Annual Fixed Cost (\$ / kW-yr) | Production Costs    |        |      |                        |        |      |                      |        |      | Total Annual Costs  |        |      |                        |        |      |                      |        |      |
|--------------------------------------|---------------------|--------|------|------------------------|--------|------|----------------------|--------|------|---------------------|--------|------|------------------------|--------|------|----------------------|--------|------|
|                                      | Low Capacity Factor |        |      | Medium Capacity Factor |        |      | High Capacity Factor |        |      | Low Capacity Factor |        |      | Medium Capacity Factor |        |      | High Capacity Factor |        |      |
|                                      | Fuel Price          |        |      | Fuel Price             |        |      | Fuel Price           |        |      | Fuel Price          |        |      | Fuel Price             |        |      | Fuel Price           |        |      |
|                                      | Low                 | Medium | High | Low                    | Medium | High | Low                  | Medium | High | Low                 | Medium | High | Low                    | Medium | High | Low                  | Medium | High |
| -47                                  | 8                   | 9      | 11   | 16                     | 19     | 21   | 24                   | 28     | 32   | -39                 | -38    | -36  | -31                    | -28    | -26  | -23                  | -19    | -15  |
| -52                                  | 8                   | 10     | 15   | 15                     | 20     | 30   | 23                   | 30     | 45   | -45                 | -42    | -37  | -37                    | -32    | -22  | -29                  | -22    | -7   |
| -52                                  | 10                  | 13     | 19   | 20                     | 26     | 38   | 29                   | 38     | 57   | -43                 | -40    | -34  | -33                    | -27    | -15  | -23                  | -14    | 4    |
| -49                                  | 8                   | 12     | 19   | 17                     | 24     | 37   | 25                   | 36     | 56   | -41                 | -37    | -30  | -32                    | -25    | -12  | -24                  | -13    | 7    |
| -49                                  | 9                   | 13     | 21   | 19                     | 26     | 41   | 28                   | 40     | 62   | -40                 | -36    | -28  | -30                    | -23    | -8   | -21                  | -9     | 13   |
| -55                                  | 3                   | 5      | 8    | 6                      | 10     | 16   | 9                    | 15     | 24   | -53                 | -50    | -47  | -50                    | -45    | -39  | -47                  | -40    | -31  |
| -58                                  | 3                   | 6      | 10   | 7                      | 11     | 19   | 10                   | 17     | 29   | -55                 | -52    | -48  | -51                    | -46    | -39  | -48                  | -41    | -29  |
| -59                                  | 6                   | 9      | 15   | 11                     | 19     | 30   | 17                   | 28     | 46   | -53                 | -49    | -43  | -47                    | -40    | -28  | -42                  | -31    | -13  |
| -32                                  | 4                   | 7      | 13   | 5                      | 10     | 18   | 7                    | 12     | 22   | -28                 | -25    | -19  | -27                    | -23    | -15  | -26                  | -20    | -10  |
| -37                                  | 6                   | 11     | 22   | 9                      | 15     | 29   | 11                   | 18     | 36   | -30                 | -26    | -15  | -28                    | -22    | -8   | -26                  | -18    | -1   |
| -60                                  | 54                  | 89     | 143  | 62                     | 102    | 163  | 70                   | 114    | 184  | -6                  | 29     | 83   | 2                      | 42     | 103  | 10                   | 54     | 124  |
| -61                                  | 58                  | 103    | 182  | 67                     | 118    | 208  | 75                   | 133    | 235  | -3                  | 42     | 121  | 5                      | 57     | 147  | 14                   | 71     | 173  |
| -74                                  |                     | 62     |      |                        | 70     |      |                      | 79     |      | -13                 |        |      |                        | -4     |      |                      | 5      |      |
| -51                                  | 46                  | 75     | 132  | 53                     | 86     | 151  | 59                   | 97     | 170  | -5                  | 24     | 81   | 1                      | 35     | 100  | 8                    | 45     | 118  |
| -80                                  | 0                   | 1      | 3    | 0                      | 2      | 6    | 0                    | 3      | 9    | -79                 | -78    | -77  | -79                    | -77    | -74  | -79                  | -76    | -71  |
| -46                                  |                     | -7     |      |                        | -13    |      |                      | -20    |      | -53                 |        |      |                        | -60    |      |                      | -66    |      |
| -46                                  |                     | -8     |      |                        | -17    |      |                      | -25    |      | -55                 |        |      |                        | -63    |      |                      | -72    |      |

## Appendix C.4 Reliability Results

Tables similar to Table 4-2, which shows Reliability Results for the Base Case, are provided in Table C.4(a) for the Southern Intertie Project Case, Table C.4(b) for the Pseudo-Healy Clean Coal Project Case, and Table C.4(c) for the Emma Creek Coal Project Case.

Table C.4(a)  
Southern Intertie Project Case Reliability Results

| Year | Loss of Load Probability by Area (%) |           |       | Capacity by Area (MW) |       |           |       | Expected Peak Load by Area (MW) |           |       | Reserve Margin by Area (%) |           |       |       | Reserve Margin by Utility (%) |              |
|------|--------------------------------------|-----------|-------|-----------------------|-------|-----------|-------|---------------------------------|-----------|-------|----------------------------|-----------|-------|-------|-------------------------------|--------------|
|      | Fairbanks                            | Anchorage | Kenai | Fairbanks             | Healy | Anchorage | Kenai | Fairbanks                       | Anchorage | Kenai | Fairbanks                  | Anchorage | Kenai | Total | GVEA                          | Chugach/ML&P |
| 2008 | 78%                                  | 1%        | 0%    | 210                   | 20    | 730       | 260   | 210                             | 540       | 80    | 0%                         | 35%       | 225%  | 47%   | 17%                           | 57%          |
| 2008 | 9%                                   | 0%        | 0%    | 250                   | 20    | 730       | 260   | 210                             | 540       | 80    | 19%                        | 35%       | 225%  | 52%   | 36%                           | 57%          |
| 2009 | 6%                                   | 0%        | 0%    | 260                   | 20    | 730       | 260   | 210                             | 550       | 80    | 24%                        | 33%       | 225%  | 51%   | 41%                           | 55%          |
| 2010 | 8%                                   | 0%        | 0%    | 260                   | 20    | 730       | 260   | 220                             | 550       | 80    | 18%                        | 33%       | 225%  | 49%   | 34%                           | 55%          |
| 2011 | 10%                                  | 0%        | 0%    | 260                   | 20    | 730       | 260   | 220                             | 560       | 80    | 18%                        | 30%       | 225%  | 48%   | 34%                           | 52%          |
| 2012 | 9%                                   | 0%        | 0%    | 270                   | 20    | 730       | 260   | 230                             | 570       | 80    | 17%                        | 28%       | 225%  | 45%   | 33%                           | 50%          |
| 2013 | 6%                                   | 0%        | 0%    | 280                   | 20    | 730       | 260   | 230                             | 570       | 80    | 22%                        | 28%       | 225%  | 47%   | 37%                           | 50%          |
| 2014 | 8%                                   | 1%        | 0%    | 280                   | 20    | 730       | 260   | 240                             | 580       | 90    | 17%                        | 26%       | 189%  | 42%   | 31%                           | 45%          |
| 2015 | 7%                                   | 1%        | 0%    | 290                   | 20    | 730       | 260   | 240                             | 590       | 90    | 21%                        | 24%       | 189%  | 41%   | 36%                           | 43%          |
| 2016 | 8%                                   | 2%        | 0%    | 290                   | 20    | 730       | 260   | 250                             | 600       | 90    | 16%                        | 22%       | 189%  | 38%   | 30%                           | 41%          |
| 2017 | 1%                                   | 2%        | 0%    | 290                   | 20    | 730       | 260   | 220                             | 610       | 90    | 32%                        | 20%       | 189%  | 41%   | 48%                           | 39%          |
| 2018 | 6%                                   | 4%        | 0%    | 270                   | 20    | 730       | 260   | 220                             | 620       | 90    | 23%                        | 18%       | 189%  | 38%   | 39%                           | 37%          |
| 2019 | 8%                                   | 7%        | 0%    | 270                   | 20    | 730       | 260   | 230                             | 630       | 90    | 17%                        | 16%       | 189%  | 35%   | 33%                           | 35%          |
| 2020 | 6%                                   | 8%        | 0%    | 290                   | 20    | 730       | 260   | 230                             | 640       | 90    | 26%                        | 14%       | 189%  | 35%   | 41%                           | 34%          |
| 2021 | 3%                                   | 8%        | 0%    | 290                   | 20    | 740       | 260   | 240                             | 650       | 90    | 21%                        | 14%       | 189%  | 34%   | 36%                           | 33%          |
| 2022 | 7%                                   | 9%        | 0%    | 300                   | 20    | 740       | 260   | 240                             | 660       | 90    | 25%                        | 12%       | 189%  | 33%   | 40%                           | 31%          |
| 2023 | 9%                                   | 9%        | 0%    | 300                   | 20    | 750       | 260   | 250                             | 670       | 90    | 20%                        | 12%       | 189%  | 32%   | 34%                           | 31%          |
| 2024 | 9%                                   | 9%        | 0%    | 310                   | 20    | 760       | 260   | 260                             | 680       | 90    | 19%                        | 12%       | 189%  | 31%   | 33%                           | 30%          |
| 2025 | 6%                                   | 8%        | 0%    | 320                   | 20    | 760       | 260   | 260                             | 690       | 90    | 23%                        | 10%       | 189%  | 31%   | 37%                           | 29%          |
| 2026 | 9%                                   | 10%       | 0%    | 320                   | 20    | 770       | 260   | 270                             | 700       | 90    | 19%                        | 10%       | 189%  | 29%   | 32%                           | 28%          |
| 2027 | 9%                                   | 9%        | 0%    | 330                   | 20    | 780       | 260   | 280                             | 710       | 90    | 18%                        | 10%       | 189%  | 29%   | 30%                           | 28%          |
| 2028 | 7%                                   | 8%        | 0%    | 340                   | 20    | 790       | 260   | 280                             | 720       | 100   | 21%                        | 10%       | 160%  | 28%   | 34%                           | 26%          |
| 2029 | 4%                                   | 7%        | 0%    | 340                   | 20    | 810       | 260   | 290                             | 730       | 100   | 17%                        | 11%       | 160%  | 28%   | 29%                           | 27%          |
| 2030 | 6%                                   | 9%        | 0%    | 340                   | 20    | 820       | 260   | 300                             | 740       | 100   | 13%                        | 11%       | 160%  | 26%   | 25%                           | 27%          |
| 2031 | 7%                                   | 7%        | 0%    | 340                   | 20    | 840       | 260   | 300                             | 750       | 100   | 13%                        | 12%       | 160%  | 27%   | 25%                           | 28%          |
| 2032 | 6%                                   | 7%        | 0%    | 350                   | 20    | 850       | 260   | 310                             | 760       | 100   | 13%                        | 12%       | 160%  | 26%   | 24%                           | 27%          |
| 2033 | 7%                                   | 7%        | 0%    | 360                   | 20    | 860       | 260   | 320                             | 770       | 100   | 13%                        | 12%       | 160%  | 26%   | 24%                           | 27%          |

Table C.4(b)  
Pseudo-Healy Clean Coal Project Case Reliability Results

| Year | Loss of Load Probability by Area (%) |           |       | Capacity by Area (MW) |       |           |       | Expected Peak Load by Area (MW) |           |       | Reserve Margin by Area (%) |           |       |       | Reserve Margin by Utility (%) |              |
|------|--------------------------------------|-----------|-------|-----------------------|-------|-----------|-------|---------------------------------|-----------|-------|----------------------------|-----------|-------|-------|-------------------------------|--------------|
|      | Fairbanks                            | Anchorage | Kenai | Fairbanks             | Healy | Anchorage | Kenai | Fairbanks                       | Anchorage | Kenai | Fairbanks                  | Anchorage | Kenai | Total | GVEA                          | Chugach/ML&P |
| 2008 | 8%                                   | 1%        | 0%    | 210                   | 70    | 730       | 260   | 210                             | 540       | 80    | 0%                         | 35%       | 225%  | 53%   | 41%                           | 57%          |
| 2008 | 8%                                   | 1%        | 0%    | 210                   | 70    | 730       | 260   | 210                             | 540       | 80    | 0%                         | 35%       | 225%  | 53%   | 41%                           | 57%          |
| 2009 | 6%                                   | 1%        | 0%    | 220                   | 70    | 730       | 260   | 210                             | 550       | 80    | 5%                         | 33%       | 225%  | 52%   | 45%                           | 55%          |
| 2010 | 7%                                   | 1%        | 0%    | 220                   | 70    | 730       | 260   | 220                             | 550       | 80    | 0%                         | 33%       | 225%  | 51%   | 39%                           | 55%          |
| 2011 | 9%                                   | 2%        | 0%    | 220                   | 70    | 730       | 260   | 220                             | 560       | 80    | 0%                         | 30%       | 225%  | 49%   | 39%                           | 52%          |
| 2012 | 6%                                   | 2%        | 0%    | 230                   | 70    | 730       | 260   | 230                             | 570       | 80    | 0%                         | 28%       | 225%  | 47%   | 37%                           | 50%          |
| 2013 | 10%                                  | 3%        | 0%    | 230                   | 70    | 730       | 260   | 230                             | 570       | 80    | 0%                         | 28%       | 225%  | 47%   | 37%                           | 50%          |
| 2014 | 7%                                   | 5%        | 0%    | 240                   | 70    | 730       | 260   | 240                             | 580       | 90    | 0%                         | 26%       | 189%  | 43%   | 36%                           | 45%          |
| 2015 | 8%                                   | 7%        | 0%    | 250                   | 70    | 730       | 260   | 240                             | 590       | 90    | 4%                         | 24%       | 189%  | 42%   | 40%                           | 43%          |
| 2016 | 9%                                   | 8%        | 0%    | 250                   | 70    | 740       | 260   | 250                             | 600       | 90    | 0%                         | 23%       | 189%  | 40%   | 34%                           | 43%          |
| 2017 | 2%                                   | 8%        | 0%    | 250                   | 70    | 740       | 260   | 220                             | 610       | 90    | 14%                        | 21%       | 189%  | 43%   | 52%                           | 41%          |
| 2018 | 8%                                   | 9%        | 0%    | 230                   | 70    | 750       | 260   | 220                             | 620       | 90    | 5%                         | 21%       | 189%  | 41%   | 43%                           | 40%          |
| 2019 | 9%                                   | 9%        | 0%    | 230                   | 70    | 760       | 260   | 230                             | 630       | 90    | 0%                         | 21%       | 189%  | 39%   | 37%                           | 40%          |
| 2020 | 8%                                   | 9%        | 0%    | 250                   | 70    | 770       | 260   | 230                             | 640       | 90    | 9%                         | 20%       | 189%  | 41%   | 46%                           | 39%          |
| 2021 | 5%                                   | 9%        | 0%    | 250                   | 70    | 780       | 260   | 240                             | 650       | 90    | 4%                         | 20%       | 189%  | 39%   | 40%                           | 38%          |
| 2022 | 7%                                   | 10%       | 0%    | 250                   | 70    | 790       | 260   | 240                             | 660       | 90    | 4%                         | 20%       | 189%  | 38%   | 40%                           | 38%          |
| 2023 | 6%                                   | 7%        | 0%    | 250                   | 70    | 810       | 260   | 250                             | 670       | 90    | 0%                         | 21%       | 189%  | 38%   | 34%                           | 39%          |
| 2024 | 6%                                   | 7%        | 0%    | 260                   | 70    | 820       | 260   | 260                             | 680       | 90    | 0%                         | 21%       | 189%  | 37%   | 33%                           | 38%          |
| 2025 | 6%                                   | 8%        | 0%    | 260                   | 70    | 820       | 260   | 260                             | 690       | 90    | 0%                         | 19%       | 189%  | 36%   | 33%                           | 37%          |
| 2026 | 6%                                   | 8%        | 0%    | 270                   | 70    | 830       | 260   | 270                             | 700       | 90    | 0%                         | 19%       | 189%  | 35%   | 32%                           | 36%          |
| 2027 | 10%                                  | 9%        | 0%    | 270                   | 70    | 840       | 260   | 280                             | 710       | 90    | -4%                        | 18%       | 189%  | 33%   | 27%                           | 36%          |
| 2028 | 6%                                   | 8%        | 0%    | 280                   | 70    | 850       | 260   | 280                             | 720       | 100   | 0%                         | 18%       | 160%  | 33%   | 30%                           | 34%          |
| 2029 | 6%                                   | 8%        | 0%    | 290                   | 70    | 860       | 260   | 290                             | 730       | 100   | 0%                         | 18%       | 160%  | 32%   | 29%                           | 33%          |
| 2030 | 6%                                   | 8%        | 0%    | 300                   | 70    | 870       | 260   | 300                             | 740       | 100   | 0%                         | 18%       | 160%  | 32%   | 28%                           | 33%          |
| 2031 | 9%                                   | 9%        | 0%    | 300                   | 70    | 880       | 260   | 300                             | 750       | 100   | 0%                         | 17%       | 160%  | 31%   | 28%                           | 32%          |
| 2032 | 9%                                   | 9%        | 0%    | 310                   | 70    | 890       | 260   | 310                             | 760       | 100   | 0%                         | 17%       | 160%  | 31%   | 27%                           | 32%          |
| 2033 | 8%                                   | 9%        | 0%    | 320                   | 70    | 900       | 260   | 320                             | 770       | 100   | 0%                         | 17%       | 160%  | 30%   | 27%                           | 32%          |

Table C.4(c)  
Emma Creek Coal Project Case Reliability Results

| Year | Loss of Load Probability by Area (%) |           |       | Capacity by Area (MW) |       |           |       | Expected Peak Load by Area (MW) |           |       | Reserve Margin by Area (%) |           |       |       | Reserve Margin by Utility (%) |              |
|------|--------------------------------------|-----------|-------|-----------------------|-------|-----------|-------|---------------------------------|-----------|-------|----------------------------|-----------|-------|-------|-------------------------------|--------------|
|      | Fairbanks                            | Anchorage | Kenai | Fairbanks             | Healy | Anchorage | Kenai | Fairbanks                       | Anchorage | Kenai | Fairbanks                  | Anchorage | Kenai | Total | GVEA                          | Chugach/ML&P |
| 2008 | 6%                                   | 1%        | 0%    | 210                   | 220   | 730       | 260   | 210                             | 540       | 80    | 0%                         | 35%       | 225%  | 71%   | 112%                          | 57%          |
| 2008 | 1%                                   | 0%        | 0%    | 210                   | 220   | 730       | 260   | 210                             | 540       | 80    | 0%                         | 35%       | 225%  | 71%   | 112%                          | 57%          |
| 2009 | 2%                                   | 0%        | 0%    | 210                   | 220   | 730       | 260   | 210                             | 550       | 80    | 0%                         | 33%       | 225%  | 69%   | 112%                          | 55%          |
| 2010 | 2%                                   | 1%        | 0%    | 210                   | 220   | 730       | 260   | 220                             | 550       | 80    | -5%                        | 33%       | 225%  | 67%   | 102%                          | 55%          |
| 2011 | 4%                                   | 1%        | 0%    | 210                   | 220   | 730       | 260   | 220                             | 560       | 80    | -5%                        | 30%       | 225%  | 65%   | 102%                          | 52%          |
| 2012 | 4%                                   | 1%        | 0%    | 210                   | 220   | 730       | 260   | 230                             | 570       | 80    | -9%                        | 28%       | 225%  | 61%   | 94%                           | 50%          |
| 2013 | 7%                                   | 2%        | 0%    | 210                   | 220   | 730       | 260   | 230                             | 570       | 80    | -9%                        | 28%       | 225%  | 61%   | 94%                           | 50%          |
| 2014 | 5%                                   | 3%        | 0%    | 220                   | 220   | 730       | 260   | 240                             | 580       | 90    | -8%                        | 26%       | 189%  | 57%   | 90%                           | 45%          |
| 2015 | 9%                                   | 5%        | 0%    | 220                   | 220   | 730       | 260   | 240                             | 590       | 90    | -8%                        | 24%       | 189%  | 55%   | 90%                           | 43%          |
| 2016 | 7%                                   | 8%        | 0%    | 230                   | 220   | 730       | 260   | 250                             | 600       | 90    | -8%                        | 22%       | 189%  | 53%   | 86%                           | 41%          |
| 2017 | 1%                                   | 7%        | 0%    | 230                   | 220   | 740       | 260   | 220                             | 610       | 90    | 5%                         | 21%       | 189%  | 58%   | 111%                          | 41%          |
| 2018 | 8%                                   | 9%        | 0%    | 210                   | 220   | 740       | 260   | 220                             | 620       | 90    | -5%                        | 19%       | 189%  | 54%   | 102%                          | 39%          |
| 2019 | 8%                                   | 9%        | 0%    | 210                   | 220   | 750       | 260   | 230                             | 630       | 90    | -9%                        | 19%       | 189%  | 52%   | 94%                           | 38%          |
| 2020 | 8%                                   | 9%        | 0%    | 220                   | 220   | 760       | 260   | 230                             | 640       | 90    | -4%                        | 19%       | 189%  | 52%   | 98%                           | 38%          |
| 2021 | 5%                                   | 7%        | 0%    | 220                   | 220   | 780       | 260   | 240                             | 650       | 90    | -8%                        | 20%       | 189%  | 51%   | 90%                           | 38%          |
| 2022 | 9%                                   | 8%        | 0%    | 220                   | 220   | 780       | 260   | 240                             | 660       | 90    | -8%                        | 18%       | 189%  | 49%   | 90%                           | 37%          |
| 2023 | 9%                                   | 8%        | 0%    | 220                   | 220   | 790       | 260   | 250                             | 670       | 90    | -12%                       | 18%       | 189%  | 48%   | 82%                           | 36%          |
| 2024 | 9%                                   | 8%        | 0%    | 230                   | 220   | 800       | 260   | 260                             | 680       | 90    | -12%                       | 18%       | 189%  | 47%   | 79%                           | 36%          |
| 2025 | 6%                                   | 9%        | 0%    | 240                   | 220   | 800       | 260   | 260                             | 690       | 90    | -8%                        | 16%       | 189%  | 46%   | 83%                           | 34%          |
| 2026 | 6%                                   | 9%        | 0%    | 250                   | 220   | 810       | 260   | 270                             | 700       | 90    | -7%                        | 16%       | 189%  | 45%   | 80%                           | 34%          |
| 2027 | 8%                                   | 9%        | 0%    | 250                   | 220   | 820       | 260   | 280                             | 710       | 90    | -11%                       | 15%       | 189%  | 44%   | 73%                           | 33%          |
| 2028 | 6%                                   | 8%        | 0%    | 260                   | 220   | 830       | 260   | 280                             | 720       | 100   | -7%                        | 15%       | 160%  | 43%   | 77%                           | 31%          |
| 2029 | 6%                                   | 9%        | 0%    | 270                   | 220   | 840       | 260   | 290                             | 730       | 100   | -7%                        | 15%       | 160%  | 42%   | 74%                           | 31%          |
| 2030 | 9%                                   | 9%        | 0%    | 270                   | 220   | 850       | 260   | 300                             | 740       | 100   | -10%                       | 15%       | 160%  | 40%   | 68%                           | 30%          |
| 2031 | 6%                                   | 9%        | 0%    | 280                   | 220   | 860       | 260   | 300                             | 750       | 100   | -7%                        | 15%       | 160%  | 41%   | 72%                           | 30%          |
| 2032 | 6%                                   | 9%        | 0%    | 290                   | 220   | 870       | 260   | 310                             | 760       | 100   | -6%                        | 14%       | 160%  | 40%   | 69%                           | 30%          |
| 2033 | 9%                                   | 10%       | 0%    | 290                   | 220   | 880       | 260   | 320                             | 770       | 100   | -9%                        | 14%       | 160%  | 39%   | 64%                           | 29%          |



## Appendix C.5 Existing and Required Capacity

Tables C.5(a) through C.5(c) present data supporting Figures 4-1 to 4-3, Existing and Required Capacity, by Load Scenario for the Fairbanks, Anchorage, and Kenai areas, respectively.

Table C.5(a)  
Fairbanks Area Existing and Required Capacity, by Load Scenario (MW)

| Year | Existing | Confidence Interval: |     |     |     |     |
|------|----------|----------------------|-----|-----|-----|-----|
|      |          | 10%                  | 30% | 50% | 70% | 90% |
| 2008 | 211      | 261                  | 261 | 261 | 261 | 261 |
| 2009 | 211      | 244                  | 256 | 265 | 273 | 286 |
| 2010 | 211      | 241                  | 258 | 270 | 283 | 302 |
| 2011 | 211      | 240                  | 261 | 276 | 292 | 317 |
| 2012 | 211      | 240                  | 264 | 282 | 301 | 330 |
| 2013 | 211      | 241                  | 268 | 288 | 309 | 344 |
| 2014 | 211      | 242                  | 271 | 294 | 318 | 357 |
| 2015 | 211      | 243                  | 275 | 300 | 327 | 370 |
| 2016 | 211      | 245                  | 280 | 306 | 336 | 384 |
| 2017 | 196      | 200                  | 230 | 254 | 280 | 322 |
| 2018 | 196      | 203                  | 235 | 261 | 289 | 335 |
| 2019 | 196      | 205                  | 240 | 267 | 298 | 348 |
| 2020 | 196      | 208                  | 245 | 274 | 307 | 361 |
| 2021 | 196      | 211                  | 250 | 281 | 316 | 375 |
| 2022 | 196      | 214                  | 256 | 289 | 326 | 389 |
| 2023 | 196      | 218                  | 261 | 296 | 336 | 403 |
| 2024 | 196      | 221                  | 267 | 304 | 346 | 417 |
| 2025 | 196      | 224                  | 272 | 311 | 356 | 432 |
| 2026 | 196      | 228                  | 278 | 319 | 366 | 447 |
| 2027 | 196      | 231                  | 284 | 327 | 377 | 463 |
| 2028 | 196      | 235                  | 290 | 335 | 388 | 478 |
| 2029 | 196      | 239                  | 296 | 344 | 399 | 495 |
| 2030 | 196      | 243                  | 302 | 352 | 410 | 511 |
| 2031 | 196      | 247                  | 309 | 361 | 422 | 528 |
| 2032 | 196      | 251                  | 315 | 370 | 434 | 546 |
| 2033 | 196      | 255                  | 322 | 379 | 446 | 564 |

Table C.5(b)  
Anchorage Area Existing and Required Capacity, by Load Scenario (MW)

| Year | Existing | Confidence Interval: |     |     |      |      |
|------|----------|----------------------|-----|-----|------|------|
|      |          | 10%                  | 30% | 50% | 70%  | 90%  |
| 2008 | 734      | 667                  | 667 | 667 | 667  | 667  |
| 2009 | 734      | 657                  | 668 | 676 | 683  | 695  |
| 2010 | 734      | 655                  | 671 | 682 | 693  | 709  |
| 2011 | 734      | 657                  | 676 | 690 | 703  | 724  |
| 2012 | 734      | 659                  | 681 | 697 | 713  | 737  |
| 2013 | 734      | 664                  | 688 | 706 | 724  | 752  |
| 2014 | 734      | 670                  | 698 | 718 | 738  | 768  |
| 2015 | 734      | 679                  | 709 | 731 | 753  | 787  |
| 2016 | 734      | 688                  | 720 | 744 | 768  | 805  |
| 2017 | 734      | 695                  | 730 | 755 | 781  | 821  |
| 2018 | 734      | 702                  | 740 | 767 | 795  | 838  |
| 2019 | 734      | 710                  | 749 | 778 | 808  | 854  |
| 2020 | 626      | 717                  | 759 | 790 | 821  | 870  |
| 2021 | 517      | 725                  | 769 | 801 | 835  | 886  |
| 2022 | 517      | 733                  | 779 | 813 | 849  | 903  |
| 2023 | 517      | 741                  | 790 | 825 | 863  | 919  |
| 2024 | 407      | 749                  | 800 | 838 | 877  | 936  |
| 2025 | 407      | 758                  | 811 | 850 | 891  | 953  |
| 2026 | 407      | 766                  | 821 | 862 | 905  | 970  |
| 2027 | 407      | 774                  | 831 | 874 | 918  | 987  |
| 2028 | 407      | 782                  | 842 | 886 | 932  | 1003 |
| 2029 | 407      | 791                  | 853 | 898 | 946  | 1021 |
| 2030 | 407      | 799                  | 863 | 911 | 961  | 1038 |
| 2031 | 407      | 808                  | 875 | 924 | 976  | 1056 |
| 2032 | 407      | 817                  | 886 | 937 | 991  | 1074 |
| 2033 | 407      | 827                  | 898 | 950 | 1006 | 1092 |

Table C.5(c)  
Kenai Area Existing and Required Capacity, by Load Scenario (MW)

| Year | Existing | Confidence Interval: |     |     |     |     |
|------|----------|----------------------|-----|-----|-----|-----|
|      |          | 10%                  | 30% | 50% | 70% | 90% |
| 2008 | 263      | 100                  | 100 | 100 | 100 | 100 |
| 2009 | 263      | 97                   | 99  | 100 | 102 | 104 |
| 2010 | 263      | 97                   | 99  | 101 | 103 | 106 |
| 2011 | 263      | 97                   | 100 | 102 | 105 | 109 |
| 2012 | 263      | 97                   | 101 | 104 | 107 | 111 |
| 2013 | 263      | 98                   | 102 | 105 | 109 | 114 |
| 2014 | 263      | 99                   | 104 | 107 | 111 | 117 |
| 2015 | 263      | 99                   | 104 | 108 | 112 | 118 |
| 2016 | 263      | 99                   | 105 | 109 | 113 | 120 |
| 2017 | 263      | 99                   | 106 | 110 | 115 | 122 |
| 2018 | 263      | 101                  | 107 | 112 | 117 | 125 |
| 2019 | 263      | 101                  | 108 | 113 | 118 | 126 |
| 2020 | 263      | 101                  | 108 | 113 | 119 | 127 |
| 2021 | 263      | 101                  | 108 | 114 | 120 | 129 |
| 2022 | 263      | 101                  | 109 | 114 | 121 | 130 |
| 2023 | 263      | 101                  | 109 | 115 | 121 | 131 |
| 2024 | 263      | 101                  | 109 | 116 | 122 | 133 |
| 2025 | 263      | 101                  | 110 | 116 | 123 | 134 |
| 2026 | 263      | 101                  | 110 | 117 | 124 | 135 |
| 2027 | 263      | 101                  | 111 | 117 | 125 | 136 |
| 2028 | 263      | 101                  | 111 | 118 | 126 | 137 |
| 2029 | 263      | 101                  | 111 | 119 | 126 | 139 |
| 2030 | 263      | 102                  | 112 | 119 | 127 | 140 |
| 2031 | 263      | 102                  | 112 | 120 | 128 | 141 |
| 2032 | 263      | 102                  | 112 | 120 | 129 | 142 |
| 2033 | 263      | 102                  | 113 | 121 | 130 | 144 |

## Appendix C.6 Capacity Additions

Tables in Appendix C.6 depict decisions that would be made for the Generic Coal Case, the Emma Creek Coal Project Case, the Fire Island Wind Case, the Gas to Fairbanks Case, the Pseudo-Healy Clean Coal Project Case, the Nikiski Case, and the Southern Intertie Project Case under three distinct scenarios—if Low Loads and Natural gas prices occur, if expected loads and natural gas prices occur, and if high loads and natural gas prices occur.

Table C.6(a)  
Generic Coal Case Capacity Additions  
If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks      |             |             |              |                                 | Anchorage      |             |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|----------------|-------------|-------------|--------------|---------------------------------|----------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 |                | 1           |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2009 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2010 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2011 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2012 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2013 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2014 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2015 |                |             |             |              | 85                              | 1              |             |             |              | 150                             | 235   |
| 2016 |                |             |             |              | 85                              |                |             |             |              | 150                             | 235   |
| 2017 |                |             |             |              | 85                              |                |             |             |              | 150                             | 235   |
| 2018 |                |             |             |              | 85                              |                |             |             |              | 150                             | 235   |
| 2019 |                |             |             |              | 85                              |                |             |             |              | 150                             | 235   |
| 2020 |                |             |             |              | 85                              |                |             |             | 1            | 280                             | 365   |
| 2021 |                |             |             |              | 85                              |                |             |             | 1            | 410                             | 495   |
| 2022 |                |             |             |              | 85                              |                |             |             |              | 410                             | 495   |
| 2023 |                |             |             |              | 85                              |                |             |             |              | 410                             | 495   |
| 2024 |                |             |             |              | 85                              |                |             |             | 1            | 540                             | 625   |
| 2025 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |
| 2026 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |
| 2027 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |
| 2028 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |
| 2029 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |
| 2030 |                |             |             |              | 85                              |                |             |             |              | 540                             | 625   |

**Table C.6(b)**  
**Generic Coal Case Capacity Additions**  
**If Expected Loads and Natural Gas Prices Occur**

| Year | Fairbanks      |             |             |              |                                 | Anchorage      |             |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|----------------|-------------|-------------|--------------|---------------------------------|----------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 |                | 1           |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2009 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2010 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2011 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2012 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2013 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2014 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2015 | 1              | 1           |             |              | 320                             | 1              |             |             |              | 150                             | 470   |
| 2016 |                |             |             |              | 320                             |                |             |             |              | 150                             | 470   |
| 2017 |                |             |             |              | 320                             |                |             |             |              | 150                             | 470   |
| 2018 |                |             |             |              | 320                             |                |             |             |              | 150                             | 470   |
| 2019 |                |             |             |              | 320                             |                |             |             |              | 150                             | 470   |
| 2020 |                |             |             |              | 320                             |                |             |             | 1            | 280                             | 600   |
| 2021 |                |             |             |              | 320                             |                |             |             | 1            | 410                             | 730   |
| 2022 |                |             |             |              | 320                             |                |             |             |              | 410                             | 730   |
| 2023 |                |             |             |              | 320                             |                |             |             |              | 410                             | 730   |
| 2024 |                |             |             |              | 320                             |                |             |             | 1            | 540                             | 860   |
| 2025 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |
| 2026 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |
| 2027 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |
| 2028 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |
| 2029 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |
| 2030 |                |             |             |              | 320                             |                |             |             |              | 540                             | 860   |

Table C.6(c)  
 Generic Coal Case Capacity Additions  
 If High Loads and Natural Gas Prices Occur

| Year | Fairbanks      |             |             |              |                                 | Anchorage      |             |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|----------------|-------------|-------------|--------------|---------------------------------|----------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) | # Units        |             |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 150 MW<br>Coal | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 |                | 1           |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2009 |                |             |             |              | 85                              |                |             |             |              | 0                               | 85  |
| 2010 |                | 1           |             |              | 170                             |                |             |             |              | 0                               | 170   |
| 2011 |                |             |             |              | 170                             |                |             |             |              | 0                               | 170   |
| 2012 |                |             |             |              | 170                             |                |             |             | 1            | 130                             | 300   |
| 2013 |                |             |             |              | 170                             |                |             |             |              | 130                             | 300   |
| 2014 |                |             |             |              | 170                             |                |             |             |              | 130                             | 300   |
| 2015 | 1              |             |             |              | 320                             | 1              |             |             |              | 280                             | 600   |
| 2016 |                |             |             |              | 320                             |                |             |             |              | 280                             | 600   |
| 2017 |                |             |             |              | 320                             |                |             |             |              | 280                             | 600   |
| 2018 |                |             |             |              | 320                             |                |             |             |              | 280                             | 600   |
| 2019 |                |             |             |              | 320                             |                |             |             |              | 280                             | 600   |
| 2020 |                |             |             |              | 320                             |                |             |             |              | 280                             | 600   |
| 2021 |                |             |             |              | 320                             |                |             |             | 1            | 410                             | 730   |
| 2022 |                |             |             |              | 320                             |                |             |             |              | 410                             | 730   |
| 2023 |                |             |             |              | 320                             |                |             |             |              | 410                             | 730   |
| 2024 |                |             |             |              | 320                             |                |             |             | 1            | 540                             | 860   |
| 2025 |                |             |             |              | 320                             |                |             | 1           |              | 600                             | 920   |
| 2026 |                |             |             |              | 320                             |                |             |             |              | 600                             | 920   |
| 2027 |                |             |             |              | 320                             |                |             |             |              | 600                             | 920   |
| 2028 |                |             |             |              | 320                             |                |             |             |              | 600                             | 920   |
| 2029 |                |             |             |              | 320                             |                |             |             |              | 600                             | 920   |
| 2030 |                |             |             |              | 320                             |                |             |             |              | 600                             | 920   |

Table C.6(d)  
 Emma Creek Coal Project Case Capacity Additions  
 If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2021 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2022 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2023 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2024 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2025 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2026 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2027 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2028 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2029 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2030 |             |             |              | 85                              |             |             |              | 390                             | 475   |

Table C.6(e)  
 Emma Creek Coal Project Case Capacity Additions  
 If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2018 |             |             |              | 85                              |             |             |              | 130                             | 215   |
| 2019 |             |             |              | 85                              |             |             |              | 130                             | 215   |
| 2020 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2021 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2022 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2023 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2024 |             |             |              | 85                              |             |             | 1            | 520                             | 605   |
| 2025 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2026 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2027 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2028 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2029 |             | 1           |              | 145                             |             |             |              | 520                             | 665   |
| 2030 |             |             |              | 145                             |             |             |              | 520                             | 665   |

Table C.6(f)  
 Emma Creek Coal Project Case Capacity Additions  
 If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2011 |             |             |              | 145                             |             |             |              | 0                               | 145   |
| 2012 |             |             |              | 145                             |             |             |              | 0                               | 145   |
| 2013 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2014 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2015 |             |             |              | 145                             |             |             | 1            | 260                             | 405   |
| 2016 |             |             |              | 145                             |             |             |              | 260                             | 405   |
| 2017 |             |             |              | 145                             |             |             |              | 260                             | 405   |
| 2018 |             |             |              | 145                             |             |             |              | 260                             | 405   |
| 2019 |             |             |              | 145                             |             |             | 1            | 390                             | 535   |
| 2020 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2021 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2022 |             |             |              | 145                             |             |             | 1            | 520                             | 665   |
| 2023 | 1           |             |              | 230                             |             |             |              | 520                             | 750   |
| 2024 |             |             |              | 230                             |             |             |              | 520                             | 750   |
| 2025 |             |             |              | 230                             |             |             | 1            | 650                             | 880   |
| 2026 |             |             |              | 230                             |             |             |              | 650                             | 880   |
| 2027 |             |             |              | 230                             |             |             |              | 650                             | 880   |
| 2028 |             |             |              | 230                             |             |             |              | 650                             | 880   |
| 2029 |             |             | 1            | 360                             |             |             |              | 650                             | 1010  |
| 2030 |             |             |              | 360                             |             |             |              | 650                             | 1010  |

Table C.6(g)  
 Fire Island Wind Project Case Capacity Additions  
 If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2021 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2022 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2023 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2024 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2025 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2026 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2027 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2028 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2029 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2030 |             |             |              | 85                              |             | 1           |              | 450                             | 535   |

Table C.6(h)  
 Fire Island Wind Project Case Capacity Additions  
 If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2015 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2016 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2017 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2018 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2019 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2020 |             |             |              | 145                             |             |             | 1            | 260                             | 405   |
| 2021 |             |             |              | 145                             |             |             | 1            | 390                             | 535   |
| 2022 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2023 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2024 |             |             |              | 145                             |             |             | 1            | 520                             | 665   |
| 2025 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2026 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2027 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2028 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2029 |             | 1           |              | 205                             |             |             |              | 520                             | 725   |
| 2030 |             |             |              | 205                             |             |             |              | 520                             | 725   |

Table C.6(i)  
 Fire Island Wind Project Case Capacity Additions  
 If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2010 |             |             |              | 145                             |             |             |              | 0                               | 145   |
| 2011 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2012 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2013 |             | 1           |              | 205                             |             |             | 1            | 260                             | 465   |
| 2014 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2015 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2016 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2017 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2018 |             |             |              | 205                             |             |             | 1            | 390                             | 595   |
| 2019 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2020 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2021 |             |             |              | 205                             |             |             | 1            | 520                             | 725   |
| 2022 |             |             |              | 205                             |             |             |              | 520                             | 725   |
| 2023 |             |             | 1            | 335                             |             |             |              | 520                             | 855   |
| 2024 |             |             |              | 335                             |             |             | 1            | 580                             | 915   |
| 2025 |             |             |              | 335                             |             |             |              | 580                             | 915   |
| 2026 |             |             |              | 335                             |             |             |              | 580                             | 915   |
| 2027 |             |             |              | 335                             |             |             |              | 580                             | 915   |
| 2028 |             |             |              | 335                             |             |             | 1            | 640                             | 975   |
| 2029 |             |             |              | 335                             |             |             |              | 640                             | 975   |
| 2030 |             |             |              | 335                             |             |             |              | 640                             | 975   |

Table C.6(j)  
 Natural Gas to Fairbanks Case Capacity Additions  
 If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2021 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2022 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2023 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2024 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2025 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2026 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2027 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2028 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2029 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2030 |             |             |              | 85                              |             |             | 1            | 450                             | 535   |

Table C.6(k)  
 Natural Gas to Fairbanks Case Capacity Additions  
 If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             | 1            | 215                             |             |             | 1            | 130                             | 345   |
| 2016 |             |             |              | 215                             |             |             |              | 130                             | 345   |
| 2017 |             |             |              | 215                             |             |             |              | 130                             | 345   |
| 2018 |             |             |              | 215                             |             |             |              | 130                             | 345   |
| 2019 |             |             |              | 215                             |             |             |              | 130                             | 345   |
| 2020 |             |             |              | 215                             |             |             | 1            | 260                             | 475   |
| 2021 |             |             |              | 215                             |             |             | 1            | 390                             | 605   |
| 2022 |             |             |              | 215                             |             |             |              | 390                             | 605   |
| 2023 |             |             |              | 215                             |             |             |              | 390                             | 605   |
| 2024 |             |             |              | 215                             |             |             | 1            | 520                             | 735   |
| 2025 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2026 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2027 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2028 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2029 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2030 |             |             |              | 215                             |             |             |              | 520                             | 735   |

Table C.6(l)  
 Natural Gas to Fairbanks Case Capacity Additions  
 If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             | 1            | 215                             |             |             |              | 0                               | 215   |
| 2011 |             |             |              | 215                             |             |             |              | 0                               | 215   |
| 2012 |             |             |              | 215                             |             |             | 1            | 130                             | 345   |
| 2013 |             |             |              | 215                             |             |             |              | 130                             | 345   |
| 2014 |             |             |              | 215                             |             |             | 1            | 260                             | 475   |
| 2015 |             |             |              | 215                             |             |             |              | 260                             | 475   |
| 2016 |             |             |              | 215                             |             |             | 1            | 390                             | 605   |
| 2017 |             |             |              | 215                             |             |             |              | 390                             | 605   |
| 2018 |             |             |              | 215                             |             |             |              | 390                             | 605   |
| 2019 |             |             |              | 215                             |             |             |              | 390                             | 605   |
| 2020 |             |             |              | 215                             |             |             | 1            | 520                             | 735   |
| 2021 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2022 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2023 |             |             |              | 215                             |             |             |              | 520                             | 735   |
| 2024 |             |             | 1            | 345                             |             |             | 1            | 650                             | 995   |
| 2025 |             |             |              | 345                             |             |             |              | 650                             | 995   |
| 2026 |             |             |              | 345                             |             |             |              | 650                             | 995   |
| 2027 |             |             |              | 345                             |             |             |              | 650                             | 995   |
| 2028 |             |             |              | 345                             |             |             |              | 650                             | 995   |
| 2029 |             |             |              | 345                             |             |             |              | 650                             | 995   |
| 2030 |             |             |              | 345                             |             |             |              | 650                             | 995   |

Table C.6(m)  
Pseudo-Healy Clean Coal Project Case Capacity Additions  
If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2021 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2022 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2023 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2024 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2025 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2026 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2027 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2028 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2029 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2030 |             |             |              | 85                              |             | 1           |              | 450                             | 535   |

Table C.6(n)  
Pseudo-Healy Clean Coal Project Case Capacity Additions  
If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2017 |             |             |              | 85                              |             |             |              | 130                             | 215   |
| 2018 |             |             |              | 85                              |             |             |              | 130                             | 215   |
| 2019 |             |             |              | 85                              |             |             |              | 130                             | 215   |
| 2020 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2021 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2022 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2023 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2024 |             |             |              | 85                              |             |             | 1            | 520                             | 605   |
| 2025 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2026 |             |             |              | 85                              |             |             |              | 520                             | 605   |
| 2027 |             | 1           |              | 145                             |             |             |              | 520                             | 665   |
| 2028 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2029 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2030 |             |             |              | 145                             |             |             |              | 520                             | 665   |

Table C.6(o)  
Pseudo-Healy Clean Coal Project Case Capacity Additions  
If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2012 |             | 1           |              | 145                             |             |             |              | 130                             | 275   |
| 2013 |             |             |              | 145                             |             |             | 1            | 260                             | 405   |
| 2014 |             |             |              | 145                             |             |             |              | 260                             | 405   |
| 2015 |             |             |              | 145                             |             |             |              | 260                             | 405   |
| 2016 |             |             |              | 145                             |             |             | 1            | 390                             | 535   |
| 2017 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2018 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2019 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2020 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2021 |             |             |              | 145                             |             |             | 1            | 520                             | 665   |
| 2022 |             |             | 1            | 275                             |             |             |              | 520                             | 795   |
| 2023 |             |             |              | 275                             |             |             |              | 520                             | 795   |
| 2024 |             |             |              | 275                             |             |             | 1            | 650                             | 925   |
| 2025 |             |             |              | 275                             |             |             |              | 650                             | 925   |
| 2026 |             |             |              | 275                             |             |             |              | 650                             | 925   |
| 2027 |             |             |              | 275                             |             |             |              | 650                             | 925   |
| 2028 |             |             |              | 275                             |             |             |              | 650                             | 925   |
| 2029 |             |             |              | 275                             |             |             |              | 650                             | 925   |
| 2030 |             |             | 1            | 405                             |             |             |              | 650                             | 1055  |

Table C.6(p)  
 Nikiski Repowering Project Case Capacity Additions  
 If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             |             | 1            | 130                             | 215   |
| 2021 |             |             |              | 85                              |             |             | 1            | 260                             | 345   |
| 2022 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2023 |             |             |              | 85                              |             |             |              | 260                             | 345   |
| 2024 |             |             |              | 85                              |             |             | 1            | 390                             | 475   |
| 2025 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2026 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2027 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2028 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2029 |             |             |              | 85                              |             |             |              | 390                             | 475   |
| 2030 |             |             |              | 85                              |             | 1           |              | 450                             | 535   |

Table C.6(q)  
Nikiski Repowering Project Case Capacity Additions  
If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2016 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2017 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2018 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2019 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2020 |             |             |              | 145                             |             |             | 1            | 260                             | 405   |
| 2021 |             |             |              | 145                             |             |             | 1            | 390                             | 535   |
| 2022 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2023 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2024 |             |             |              | 145                             |             |             | 1            | 520                             | 665   |
| 2025 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2026 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2027 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2028 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2029 |             | 1           |              | 205                             |             |             |              | 520                             | 725   |
| 2030 |             |             |              | 205                             |             |             |              | 520                             | 725   |

Table C.6(r)  
 Nikiski Repowering Project Case Capacity Additions  
 If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2011 |             |             |              | 145                             |             |             |              | 0                               | 145   |
| 2012 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2013 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2014 |             | 1           |              | 205                             |             |             | 1            | 260                             | 465   |
| 2015 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2016 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2017 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2018 |             |             |              | 205                             |             |             | 1            | 390                             | 595   |
| 2019 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2020 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2021 |             |             |              | 205                             |             |             | 1            | 520                             | 725   |
| 2022 |             |             |              | 205                             |             |             |              | 520                             | 725   |
| 2023 |             |             | 1            | 335                             |             |             |              | 520                             | 855   |
| 2024 |             |             |              | 335                             |             |             | 1            | 650                             | 985   |
| 2025 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2026 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2027 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2028 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2029 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2030 |             |             |              | 335                             |             |             |              | 650                             | 985   |

Table C.6(s)  
Southern Intertie Project Case Capacity Additions  
If Low Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2016 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2017 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2018 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2019 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2020 |             |             |              | 85                              |             | 1           |              | 60                              | 145   |
| 2021 |             |             |              | 85                              |             |             | 1            | 190                             | 275   |
| 2022 |             |             |              | 85                              |             |             |              | 190                             | 275   |
| 2023 |             |             |              | 85                              |             |             |              | 190                             | 275   |
| 2024 |             |             |              | 85                              |             |             | 1            | 320                             | 405   |
| 2025 |             |             |              | 85                              |             |             |              | 320                             | 405   |
| 2026 |             |             |              | 85                              |             |             |              | 320                             | 405   |
| 2027 |             |             |              | 85                              |             |             |              | 320                             | 405   |
| 2028 |             |             |              | 85                              |             | 1           |              | 380                             | 465   |
| 2029 |             |             |              | 85                              |             |             |              | 380                             | 465   |
| 2030 |             |             |              | 85                              |             |             |              | 380                             | 465   |

Table C.6(t)  
 Southern Intertie Project Case Capacity Additions  
 If Expected Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2011 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2012 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2013 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2014 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2015 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2016 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2017 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2018 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2019 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2020 |             |             |              | 145                             |             |             | 1            | 260                             | 405   |
| 2021 |             |             |              | 145                             |             |             | 1            | 390                             | 535   |
| 2022 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2023 |             |             |              | 145                             |             |             |              | 390                             | 535   |
| 2024 |             |             |              | 145                             |             |             | 1            | 520                             | 665   |
| 2025 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2026 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2027 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2028 |             |             |              | 145                             |             |             |              | 520                             | 665   |
| 2029 |             | 1           |              | 205                             |             |             |              | 520                             | 725   |
| 2030 |             |             |              | 205                             |             |             |              | 520                             | 725   |

Table C.6(u)  
Southern Intertie Project Case Capacity Additions  
If High Loads and Natural Gas Prices Occur

| Year | Fairbanks   |             |              |                                 | Anchorage   |             |              |                                 | Railbelt Total<br>Cumulative<br>Additions<br>(MW) |
|------|-------------|-------------|--------------|---------------------------------|-------------|-------------|--------------|---------------------------------|---|
|      | # Units     |             |              | Cumulative<br>Additions<br>(MW) | # Units     |             |              | Cumulative<br>Additions<br>(MW) |   |
|      | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 | 85 MW<br>CT | 60 MW<br>CC | 130 MW<br>CC |                                 |   |
| 2008 | 1           |             |              | 85                              |             |             |              | 0                               | 85  |
| 2009 |             |             |              | 85                              |             |             |              | 0                               | 85  |
| 2010 |             | 1           |              | 145                             |             |             |              | 0                               | 145   |
| 2011 |             |             |              | 145                             |             |             |              | 0                               | 145   |
| 2012 |             |             |              | 145                             |             |             | 1            | 130                             | 275   |
| 2013 |             |             |              | 145                             |             |             |              | 130                             | 275   |
| 2014 |             | 1           |              | 205                             |             |             | 1            | 260                             | 465   |
| 2015 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2016 |             |             |              | 205                             |             |             |              | 260                             | 465   |
| 2017 |             |             |              | 205                             |             |             | 1            | 390                             | 595   |
| 2018 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2019 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2020 |             |             |              | 205                             |             |             |              | 390                             | 595   |
| 2021 |             |             |              | 205                             |             |             | 1            | 520                             | 725   |
| 2022 |             |             |              | 205                             |             |             |              | 520                             | 725   |
| 2023 |             |             | 1            | 335                             |             |             |              | 520                             | 855   |
| 2024 |             |             |              | 335                             |             |             |              | 520                             | 855   |
| 2025 |             |             |              | 335                             |             |             | 1            | 650                             | 985   |
| 2026 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2027 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2028 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2029 |             |             |              | 335                             |             |             |              | 650                             | 985   |
| 2030 |             |             |              | 335                             |             |             |              | 650                             | 985   |