Scheduled Firm Access Quantities Calculation Methodology for Gate 3 Applications

EirGrid Workshop, 2 April 2009

Simon Grimes

EIRGRID

Overview

- Key Attributes of Gate 3
- Gate 3 Process (High Level)
- Transmission Node Assignments
- Calculation of scheduled firm access quantities methodology
- ‘ITC Program’
- Current status
- Summary

Gate 3 - Key Attributes

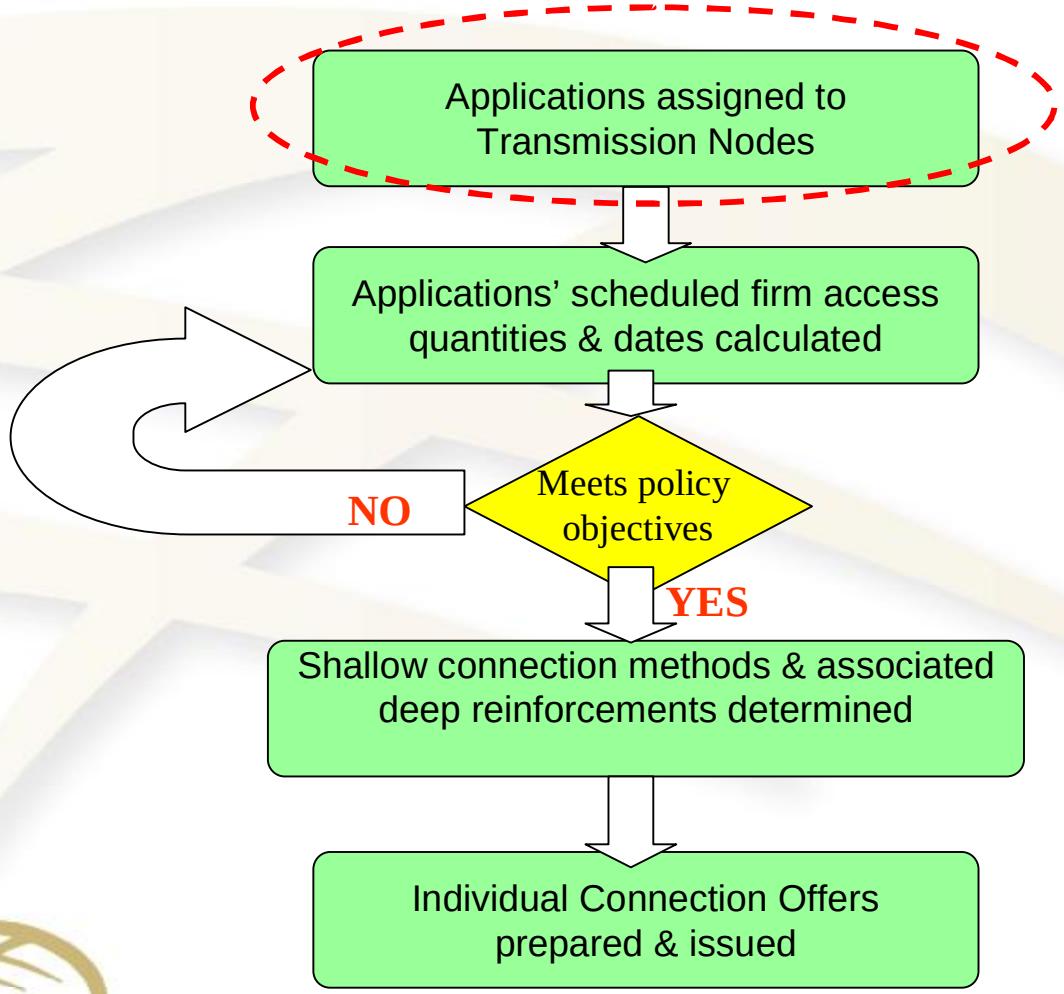
- **4000+ MW renewable plant (c. 170 applications)**
- **6000+ MW conventional plant (c. 50 applications)**
- **Connection offers scheduled to issue from Dec. ’09**
- **Offers to include scheduled firm access quantities for each year from 2010 to 2025**

EIRGRID

Gate 3 - Key Attributes (cont'd)

- **Date order allocation of transmission capacity**
- **GRID25 derived transmission network**
- **CER Direction 16th December 2008**

Gate 3 Simplified Process



Transmission Node Assignment Rules

- **Ref. Appendix 2 of CER's 16 December 2008 Gate 3 Direction**
- **Aim of rules are to:**
  - **provide transparency**
  - **provide consistent basis for applications' scheduled firm access quantity calculation**

Transmission Node Assignment Rules (cont'd)

- **Concentration of applicants <40MW – *new 38kV node may be declared***
- **Concentration >= 40MW & <=177MW – *new 110kV node (or 2 if >177MW & < 200MW) may be declared***
- **Concentration >= 177MW – *new 220kV or 400kV node may be declared***

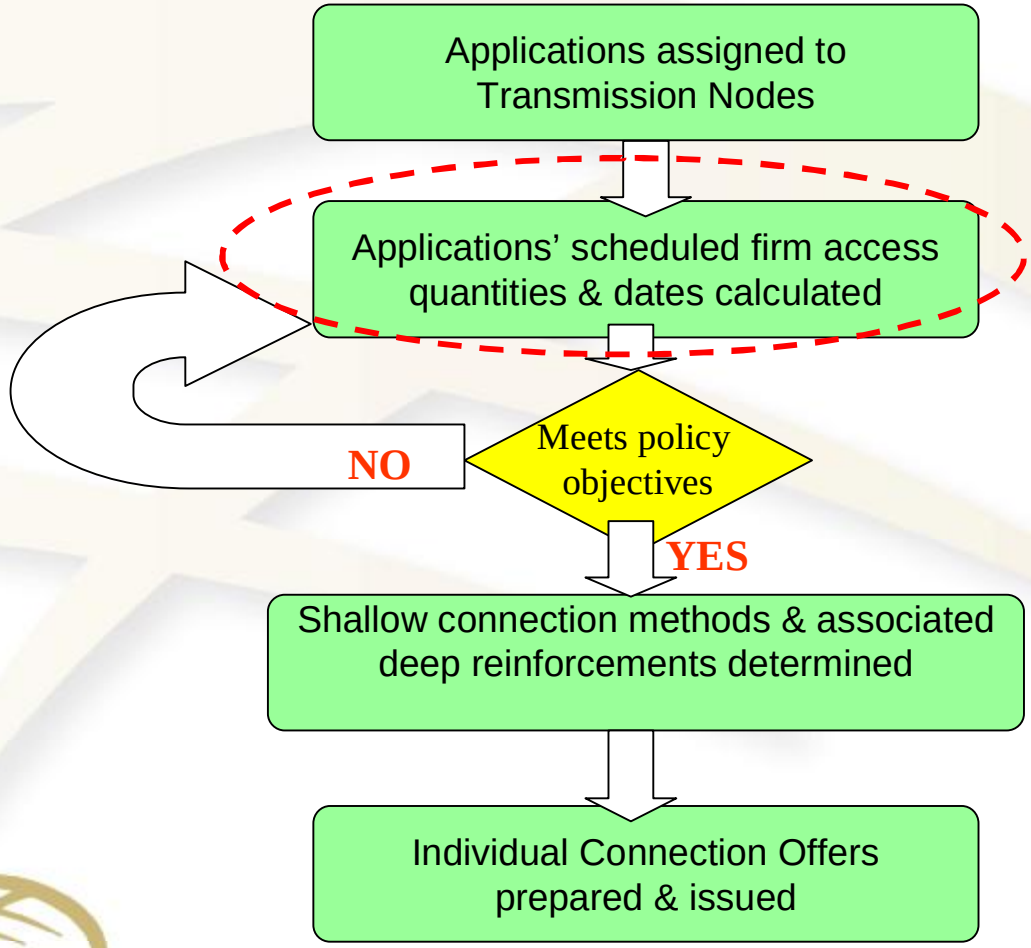
EIRGRID

Transmission Node Assignment Rules (cont'd)

Application Capacity (MW)	Node 'Rule'
<=5MW	nearest 38kV node
>5MW & <=10MW	nearest 38kV or 110kV node
>10MW & <=40MW	nearest 110kV node
>40MW & <177MW	New 110kV metered connection
>=177MW	New 220kV or 400kV metered connection

EIRGRID

Gate 3 Simplified Process



Deriving Scheduled Firm Access Quantities (FAQs) & Dates

- **Program used to derive scheduled FAQs and associated dates commonly referred to as *ITC (Incremental Transfer Capability) Program***

- **Utilized for many years for the *Forecast Statement***

‘ITC Program’ Attributes

- **ITC Program automates steps an engineer would manually take to derive firm access quantities**
  - **adding Grid25 reinforcements**
  - **adding applications in date order**
  - **assessing acceptability of each application in turn**
    - **under intact network &**
    - **single contingency (N-1) conditions**
    - **and testing for line overloads**
    - **against credible dispatch scenarios**
    - **down to 0.5MW (FAQ) tolerance**

EIRGRID

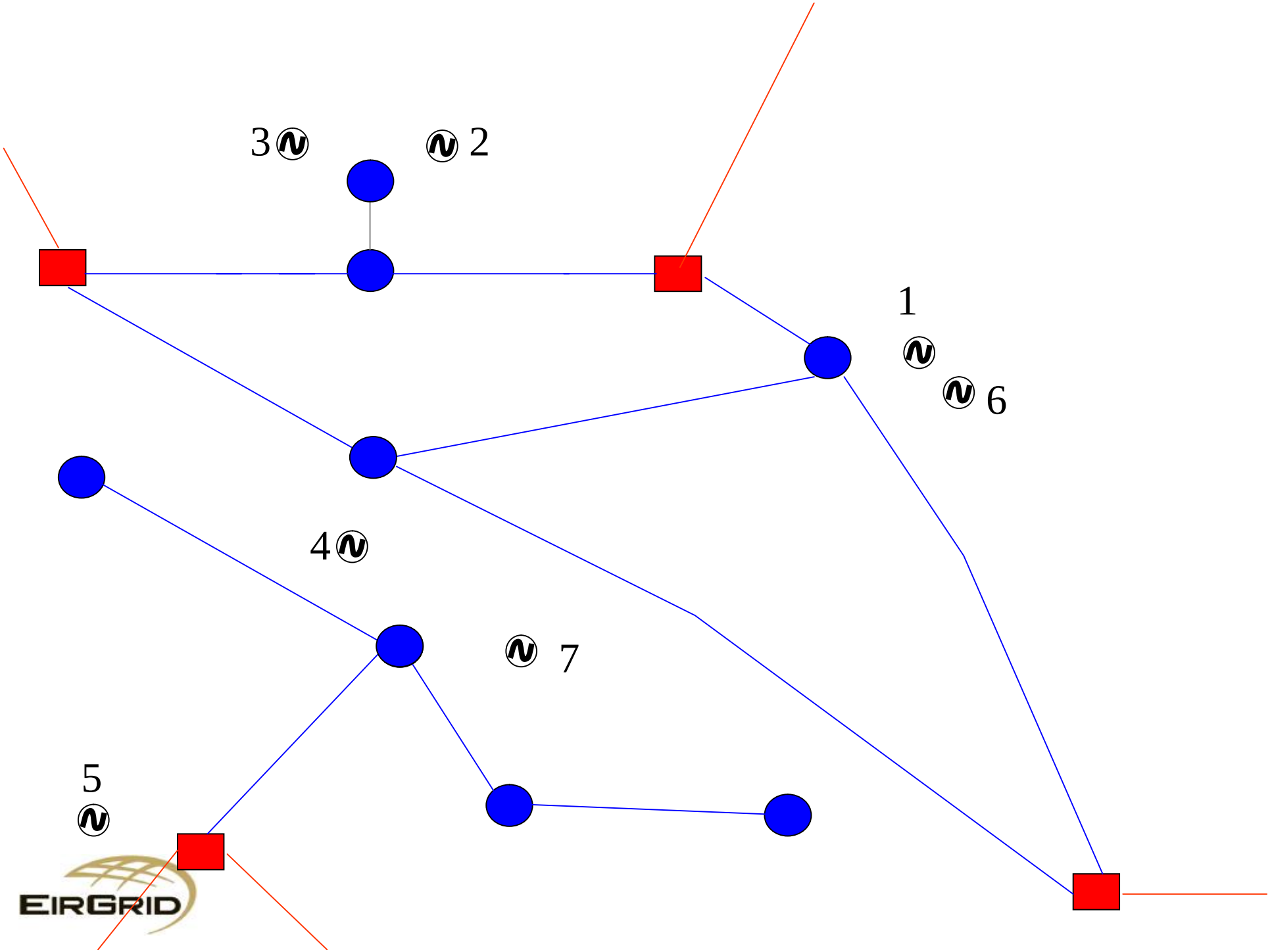
‘ITC Program’ Attributes (cont’d.)

- **3 study cases for each of the 16 years (2010-2025)**
  - **Summer night valley (SNV)**
  - **Summer peak (SP)**
  - **Winter peak (WP)**
- **224 individual applications**
- **Accepted applications’ MW remain in model & removed from list**
- **Unaccepted applications’ MW maintained in list for assessment in following year**
- **Actual FAQ is Minimum of SNV FAQ, SP FAQ & WP FAQ**

EIRGRID

Worked example of calculation of Firm Access Quantities & Associated Dates

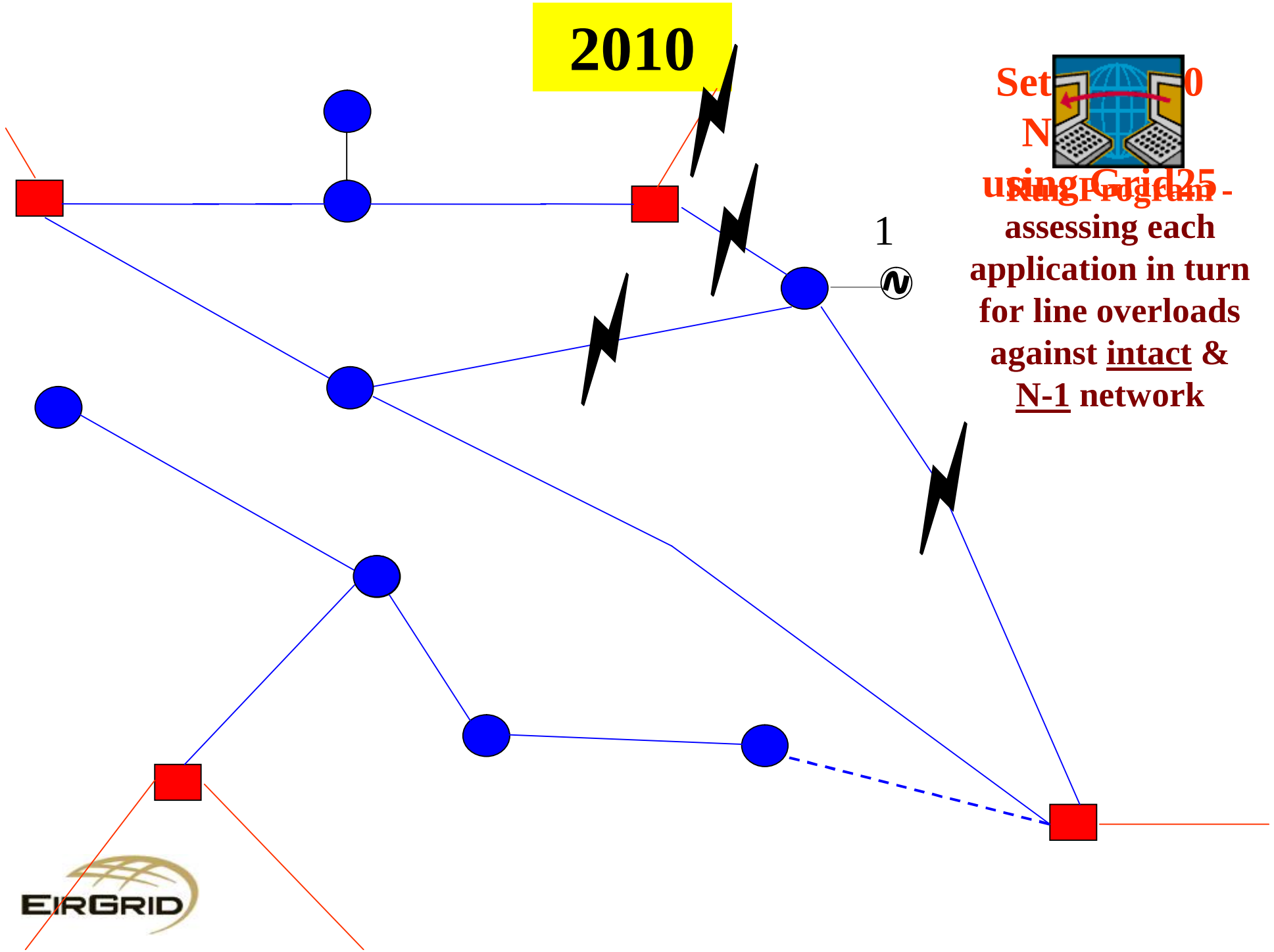
EIRGRID


3
2
1
6
4
7
5
EIRGRID

Application Details

Applicant	Type	MEC	Application Date
1	Renewable	10MW	1/1/2005
2	Renewable	30MW	1/4/2005
3	Renewable	15MW	1/5/2005
4	Renewable	12MW	1/1/2006
5	Conventional	25MW	1/6/2006
6	Renewable	10MW	1/1/2007
7	Renewable	18MW	1/5/2007

EIRGRID

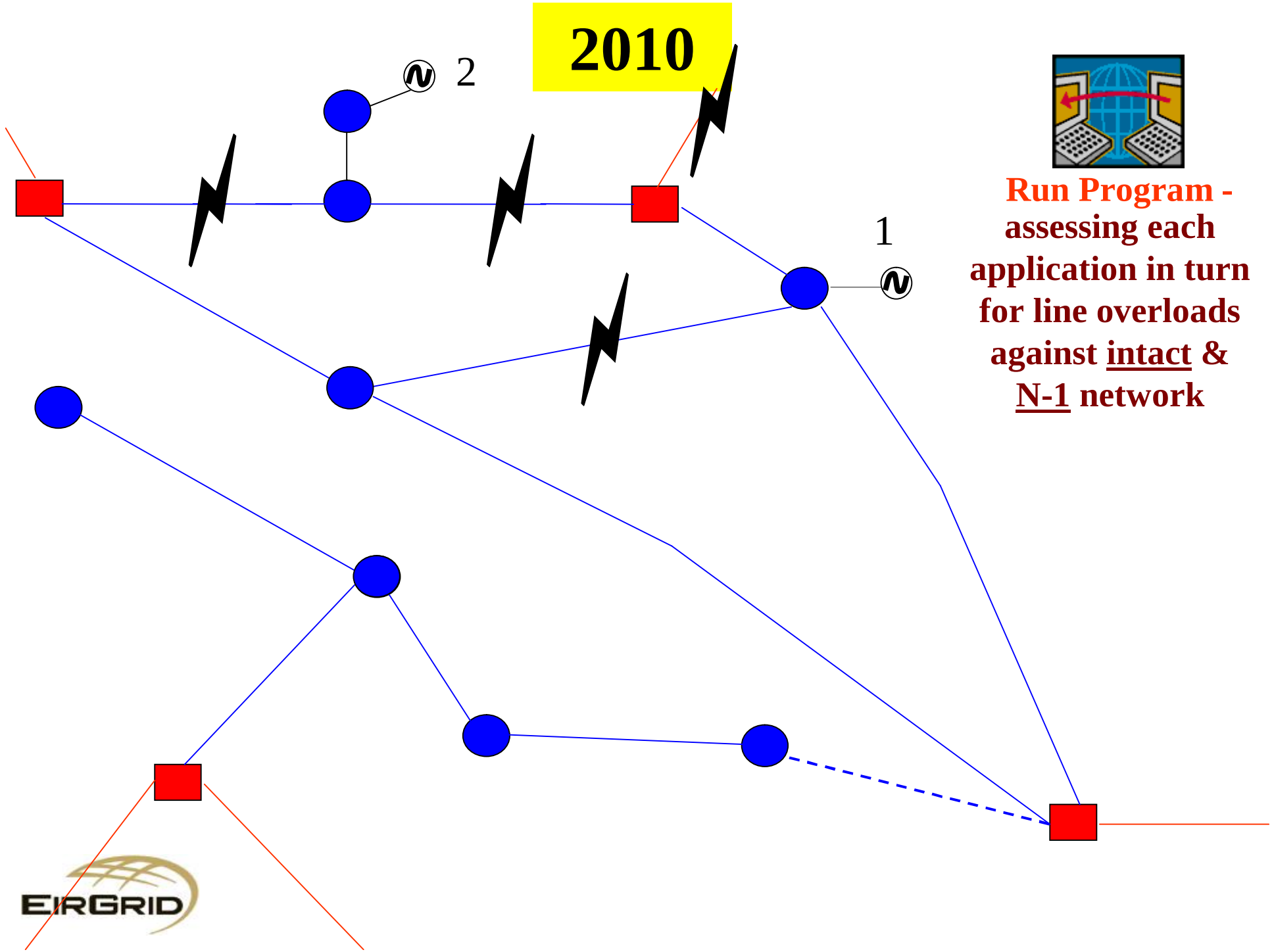

2010
Set 0
N
using Grid25
Run Program -
assessing each
application in turn
for line overloads
against intact &
N-1 network
1
N
EIRGRID

Calculation Results

Applicant	Type	MEC	FAQ 2010
1	R	10MW	10MW (MEC)
2	R	30MW	TBD
3	R	15MW	TBD
4	R	12MW	TBD
5	C	25MW	TBD
6	R	10MW	TBD
7	R	18MW	TBD

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID

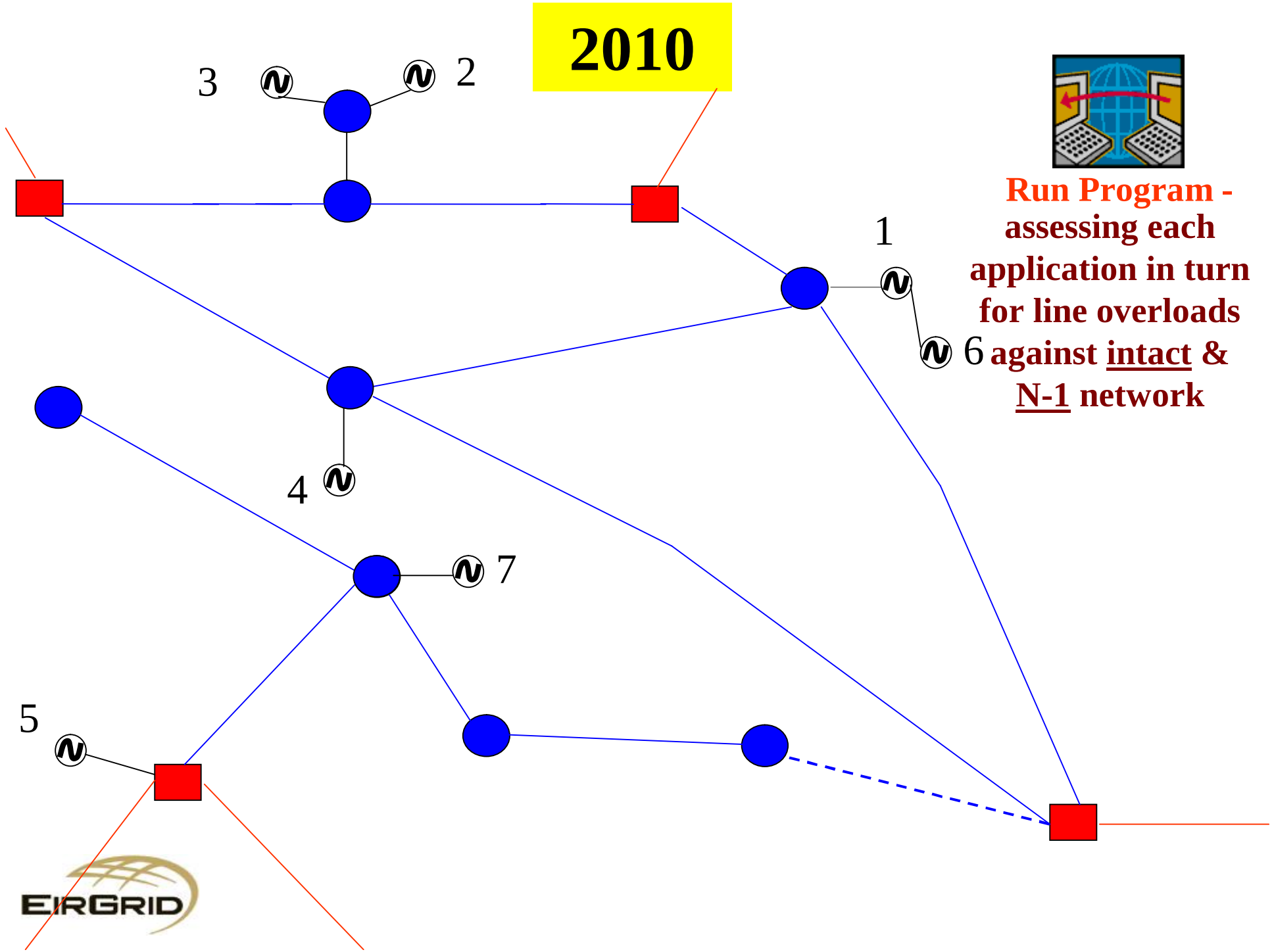

2010
2
1
Run Program -
assessing each
application in turn
for line overloads
against intact &
N-1 network
EIRGRID

Calculation Results

Applicant	Type	MEC	FAQ 2010
1	R	10MW	10MW (MEC)
2	R	30MW	15MW
3	R	15MW	TBD
4	R	12MW	TBD
5	C	25MW	TBD
6	R	10MW	TBD
7	R	18MW	TBD

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID

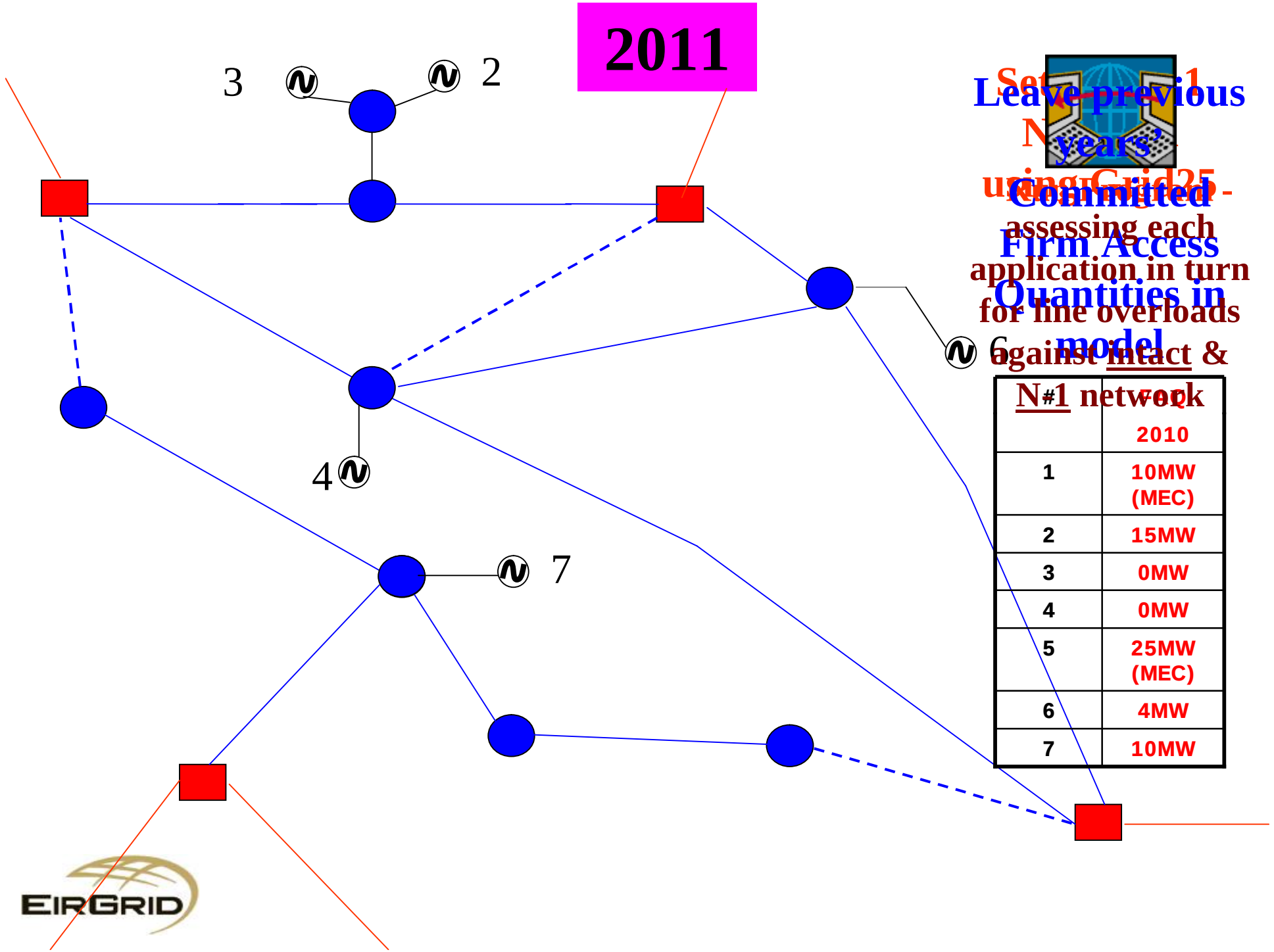

2010
3
2
1
6
4
7
5
Run Program - assessing each application in turn for line overloads against intact & N-1 network
EIRGRID

Calculation Results

Applicant	Type	MEC	FAQ 2010
1	R	10MW	10MW (MEC)
2	R	30MW	15MW
3	R	15MW	0MW
4	R	12MW	0MW
5	C	25MW	25MW (MEC)
6	R	10MW	4MW
7	R	18MW	10MW

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID



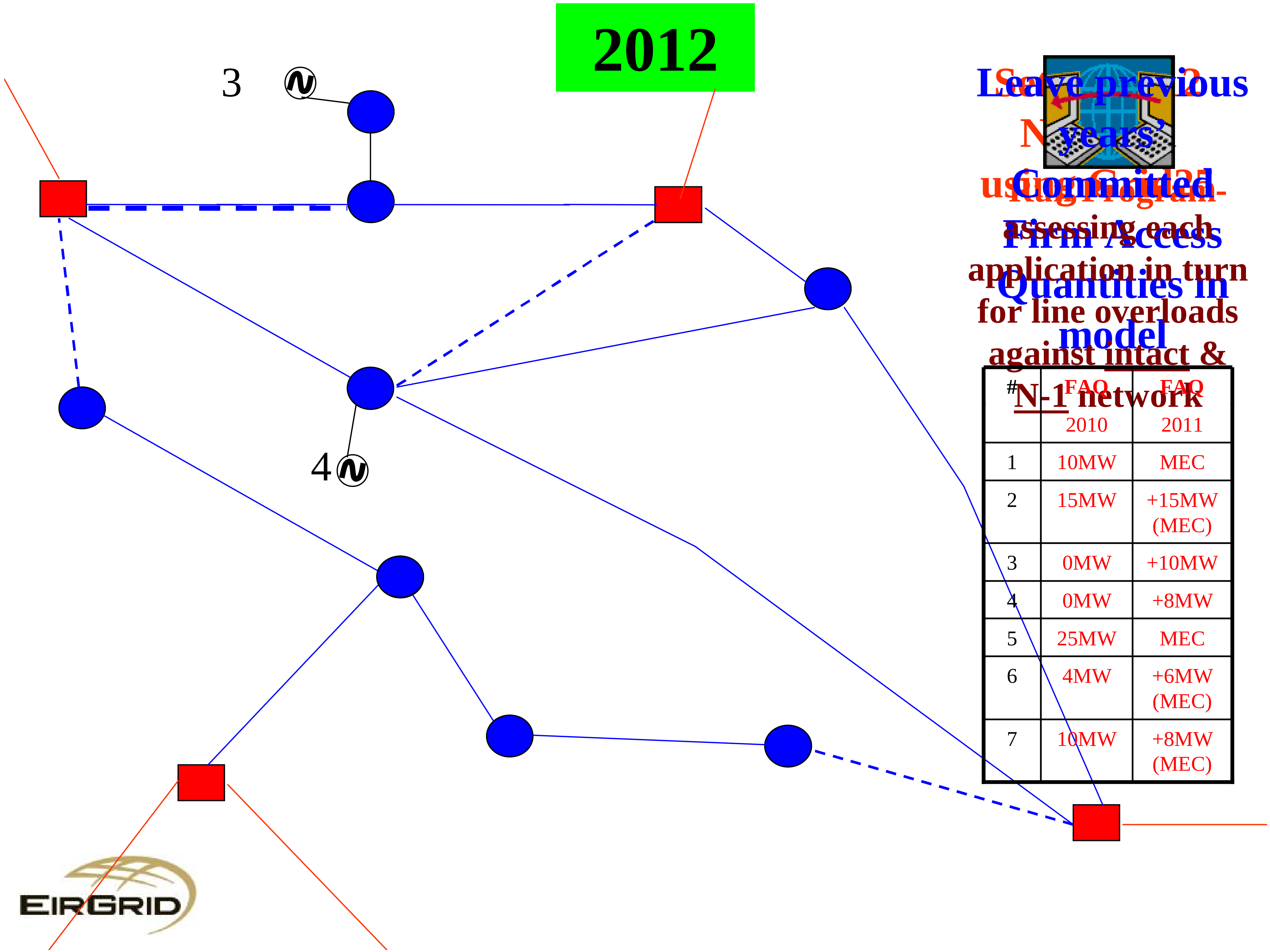
	2010
1	10MW (MEC)
2	15MW
3	0MW
4	0MW
5	25MW (MEC)
6	4MW
7	10MW

Calculation Results

Applicant	Type	MEC	FAQ 2010	FAQ 2011
1	R	10MW	10MW	MEC
2	R	30MW	15MW	+15MW (MEC)
3	R	15MW	0MW	+10MW
4	R	12MW	0MW	+8MW
5	C	25MW	25MW	MEC
6	R	10MW	4MW	+6MW (MEC)
7	R	18MW	10MW	+8MW (MEC)

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID



Leave previous years' Committed Firm Access Quantities in model

assessing each application in turn for line overloads against intact & N-1 network

#	FAQ 2010	FAQ 2011
1	10MW	MEC
2	15MW	+15MW (MEC)
3	0MW	+10MW
4	0MW	+8MW
5	25MW	MEC
6	4MW	+6MW (MEC)
7	10MW	+8MW (MEC)

Calculation Results

Applicant	Type	MEC	FAQ 2010	FAQ 2011	FAQ 2012
1	R	10MW	10MW	MEC	MEC
2	R	30MW	15MW	+15MW	MEC
3	R	15MW	0MW	+10MW	5MW(MEC)
4	R	12MW	0MW	+8MW	4MW (MEC)
5	C	25MW	25MW	MEC	MEC
6	R	10MW	4MW	+6MW	MEC
7	R	18MW	10MW	+8MW	MEC

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID

Current Status

- **Transmission nodes assigned**
- **Annual Runs started**
- **16 Annual Runs (2010-2025) scheduled to be complete by end July 2009**
- **Independent Technical Review scheduled for Aug. 09**
- **Notification of FAQs currently scheduled for Sept. 09**

EIRGRID

Summary

- **‘ITC Program’ used to derive scheduled firm access quantities (FAQs) and associated dates**
- **Gate 3 offers will include scheduled FAQs for each year from 2010 to 2025**
- **EirGrid is on course to complete calculation of FAQs by end July 2009**

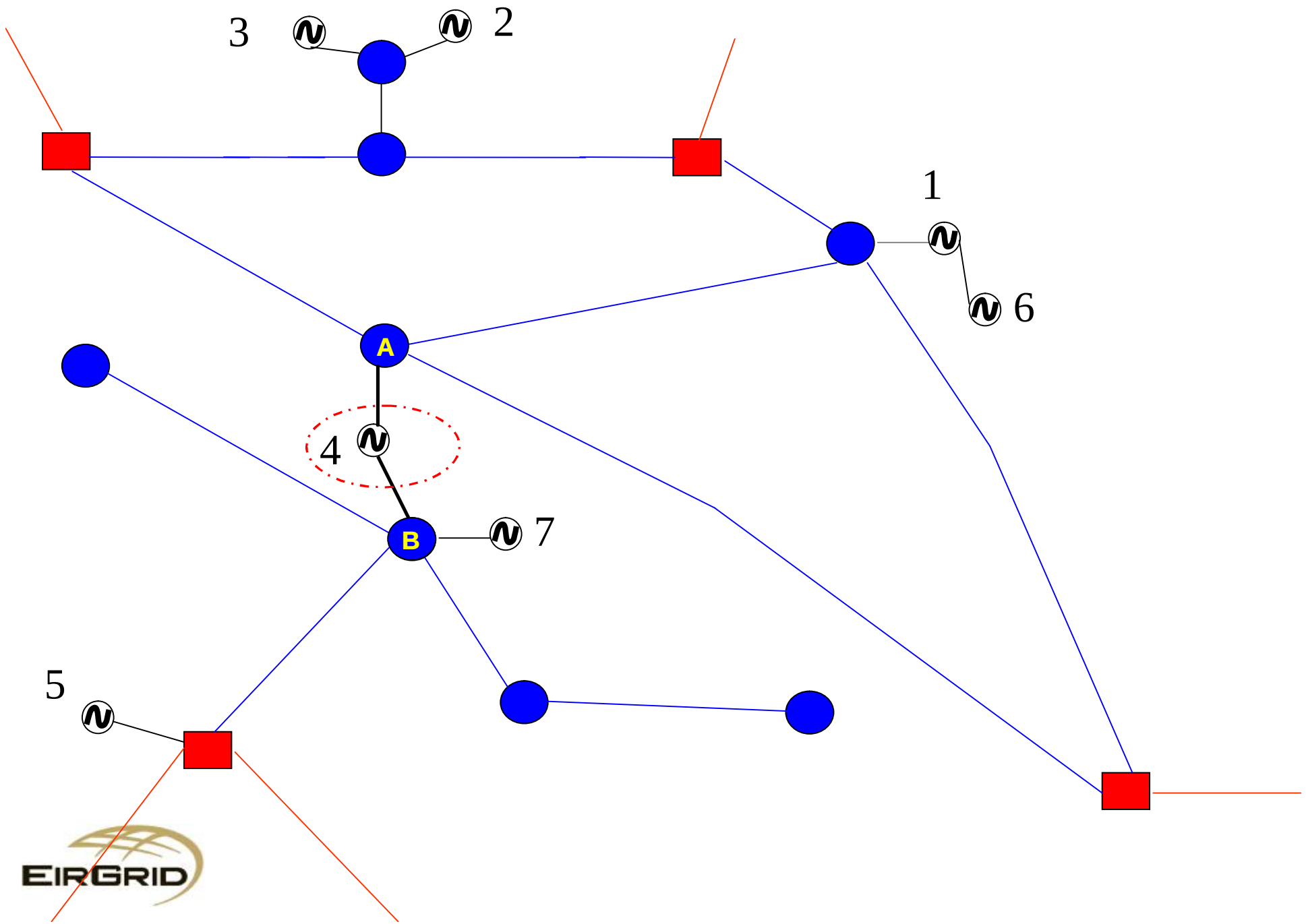
Thank you for your attention

Website: www.eirgrid.com

Email: info@eirgrid.com

Example of impact of changing an Application's Transmission Node Assignment on firm access quantities calculation

EIRGRID


3
2
1
6
A
4
B
7
5

Original 2010 FAQ Calculation Results

Applicant	Type	MEC	FAQ 2010
1	R	10MW	10MW
2	R	30MW	15MW
3	R	15MW	0MW
4	R	12MW	0MW
5	C	25MW	25MW
6	R	10MW	4MW
7	R	18MW	10MW

R: Renewable; C: Conventional; FAQ: Firm Access Quantity

EIRGRID

2010 FAQ Calculation Results Impact*

Applicant	Type	MEC	FAQ 2010
1	R	10MW	10MW (MEC)
2	R	30MW	15MW
3	R	15MW	0MW
4	R	12MW	0MW -> 12MW (MEC)
5	C	25MW	25MW -> 13MW
6	R	10MW	4MW
7	R	18MW	10MW -> 0MW

EIRGRID

* *Actual impact may be different, for illustrative purposes only*

2010-2012 FAQ Calculation Results Impact*

Applicant	Type	MEC	FAQ 2010	FAQ 2011	FAQ 2012
1	R	10MW	10MW	MEC	MEC
2	R	30MW	15MW	+15MW	MEC
3	R	15MW	0MW	+10MW -> +5MW	MEC -> +5MW
4	R	12MW	0MW -> 12MW	+8MW -> MEC	4MW -> MEC
5	C	25MW	25MW-> 13MW	MEC -> +7MW	MEC -> +5MW
6	R	10MW	4MW	+6MW -> +4MW	MEC -> +2MW
7	R	18MW	10MW -> 0MW	+8MW -> +4MW	MEC -> +10MW

EIRGRID

* *Actual impact may be different, for illustrative purposes only*

Some Implications of Changing an Application's Transmission Node Assignment

- **Application's firm access quantity levels & dates could change**
- **Firm access quantity levels & dates for other Gate 3 applications could change**
- **Re-run of any completed Annual Runs**
- **Changes to the *program's* 'input files'**
- **Delays to issuing Gate 3 offers**
- **Could lead to an iterative exercise (requiring assessments of the impact of <u>each</u> requested node change on other parties etc.) leading to even further delays**
- **Note 224 applications & 95 individual nodes!**

EIRGRID

Can Application's ever change their Transmission Node Assignment?

- **From a FAQ calculation perspective, applications may be permitted to change from their assigned node where**
  - **the node they are seeking to change to is connected (& expected to remain connected under Grid25) as a spur (tail) from their current assigned node or**
  - **the node they are currently assigned to is connected (& expected to remain connected under Grid25) as a spur (tail) from the node they are seeking to be re-assigned to**

EIRGRID

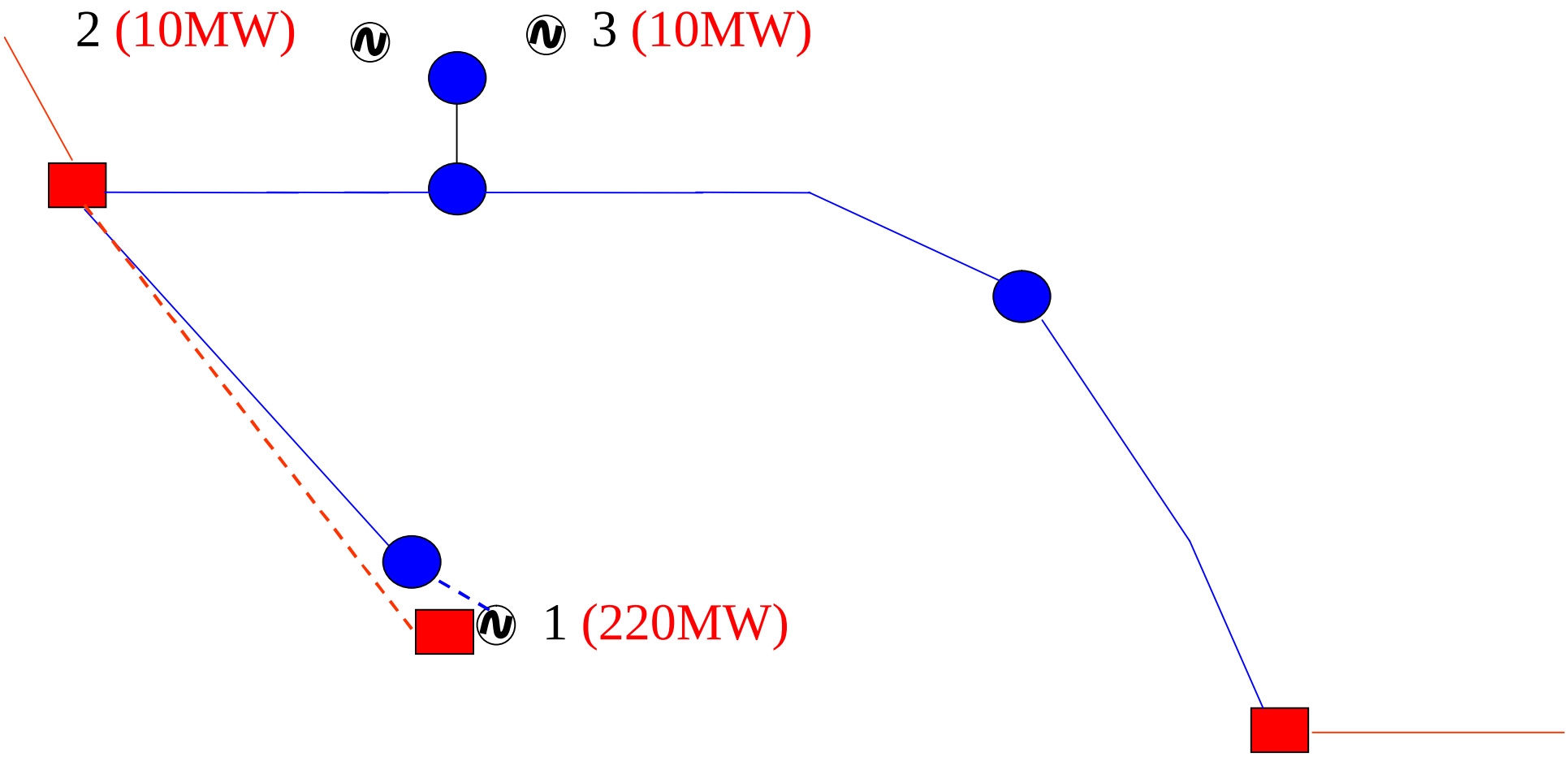
Can Application's ever change their Transmission Node Assignment?

- **From a Firm Access Quantity calculation perspective, applications may be permitted to change from their assigned node where**
  - **the node they are seeking to change to is connected (& expected to remain connected under Grid25) as a spur (tail) from their current assigned node or**
  - **the node they are currently assigned to is connected (& expected to remain connected under Grid25) as a spur (tail) from the node they are seeking to be re-assigned to**
- **Where Applicants wish to change node assignment and believe that they fall into either of the above two categories ((a) or (b)), they should contact EirGrid or ESB Networks, as appropriate**

EIRGRID

Example of issues regarding temporary Transmission Node Assignment changes for interim connections

Example Scenario



RED: 220kV; BLUE: 110kV

For this Scenario

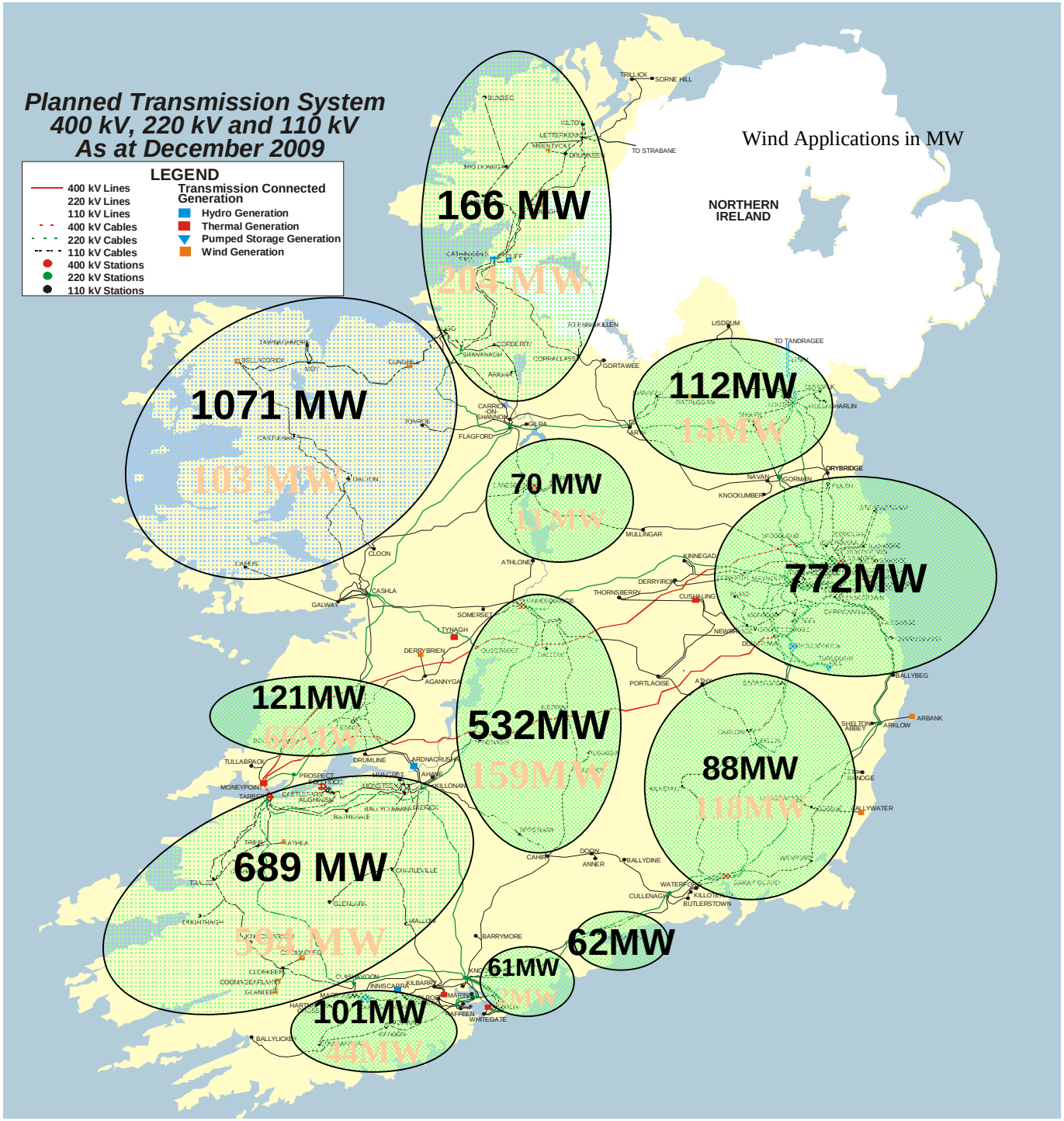
- **ITC Program would show Application 1 having early FAQ**
- **In reality, until 220kV line constructed to #1, applications 2 & 3 would see relatively low constraints**
- **If #1 connects on interim basis to local 110kV node, what about affect on constraint levels for #2 & #3**
  - **Should interim connections be allowed to leap-frog permanent connections in terms of actual firm access?**

EIRGRID

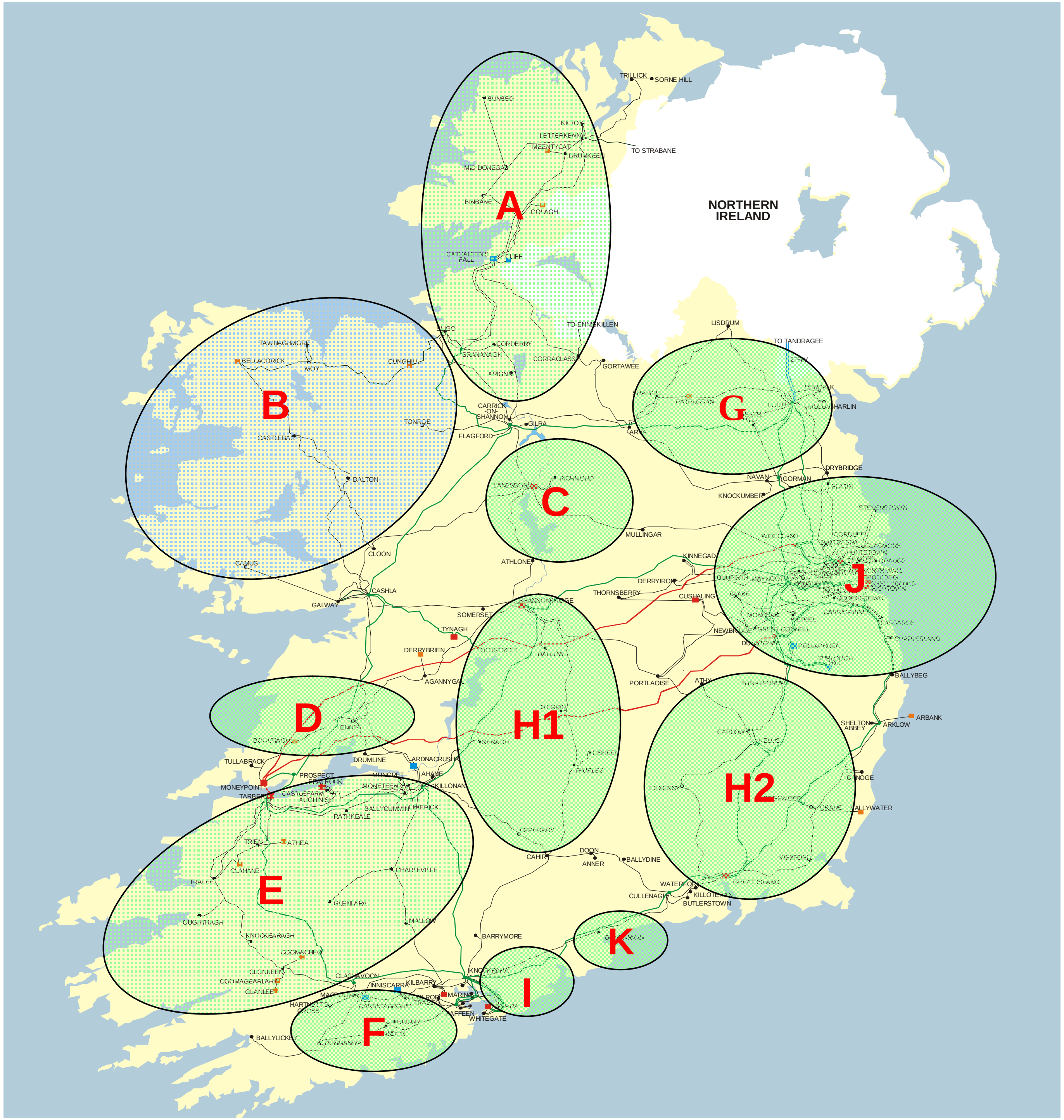
Gate 3 ≈ 3900 MW

Gate 2 ≈ 1300 MW

Conventional applications not incld.



Gate 3 Areas


A
B
C
D
E
F
G
H1
H2
I
J
K
NORTHERN IRELAND
TRILLICK
SORNE HILL
TO STRABANE
TO ENNISKILLEN
LISDRUM
TO TANDRAGEE
GORTAWEE
CARRICK ON SHANNON
GILRA
FLAGFORD
DRYBRIDGE
NAVAN
GORMAN
KNOCKUMBER
MULLINGAR
ATHLONE
CLOON
CASHLA
GALWAY
SOMERSET
TYNAGH
DERRYBRIEN
AGANNYGAL
KINNEGAD
DERRYIRON
THORNSBERRY
CUSHALING
NEWBRIDGE
PORTLAOISE
ATHY
BALLYBEG
ARBANK
SHELTON ABBEY
ARKLOW
BANOGE
BALLYWATER
TULLABRACK
MONEYPOINT
TARBERT
DRUMLINE
ARDNACRUSHA
AHANE
KILLONAN
PROSPECT
CASTLEFARM
BALLYCUMMIN
LIMERICK
RATHKEALE
CAHIR
DOON
ANNER
BALLYDINE
WATERFORD
CULLENAGH
KILLOTERAN
BUTLERSTOWN
BARRYMORE
KNOCKRAHA
INNISCARRA
KILBARRY
MARINA
AGHADA
WHITEGATE
BALLYLICKEY

Groups, Sub-groups & Areas