



# Smart Grid Broadband Spectrum: Potential Sources and Challenges

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# Objectives

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1. Provide operative definition of broadband
2. Highlight essentials for wireless deployments
3. Describe utilities' broadband spectrum challenge
4. Identify spectrum capable of supporting broadband requirements
5. Explain paths of acquiring auctioned spectrum
6. Convey realities of market for auctioned spectrum

# Operative Broadband Definition

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## Broadband Bandwidth Requirement

Minimum 500 kHz bandwidth

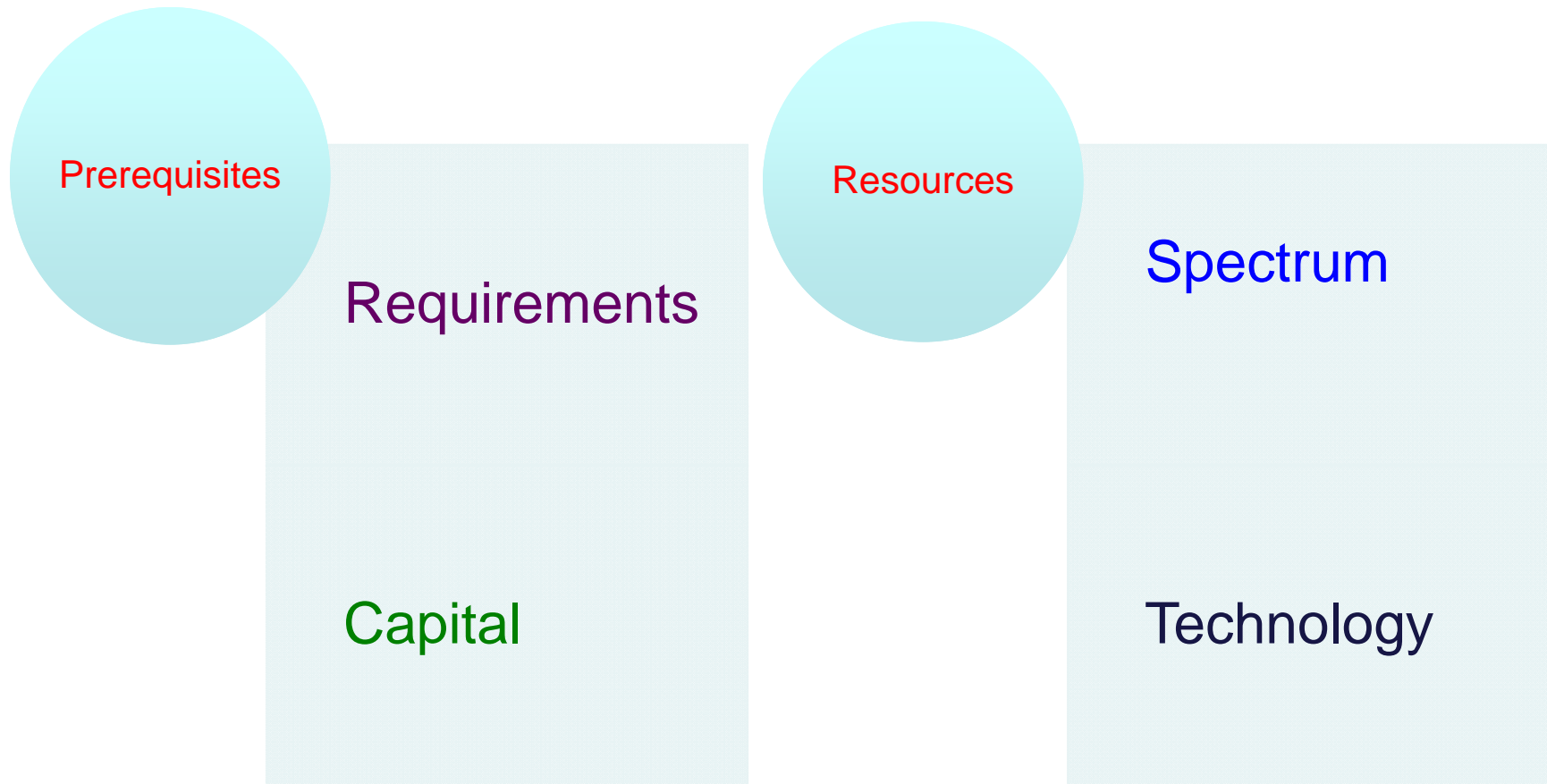
(Upstream and Downstream)

Delivers 1 Mbps Throughput

Enables IP Networking

# Essentials for Wireless Deployments

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# Utilities' Broadband Spectrum Challenge

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## Parts 90 and 101

No broadband point-to-multipoint spectrum

No private (CII) broadband spectrum, Yet

FCC—National Broadband Plan??????

Congress—Spectrum Inventory Legislation

Carrier Wireless Broadband Services

A viable solution??

BusinessWeek, “AT&T’s iProblem” (Feb.15, 2010)

# Utilities' Broadband Spectrum Challenge

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## Potential Broadband Spectrum Options

1. Unlicensed spectrum
2. Hybrid/Registration spectrum
3. Auctioned spectrum

### Virtues of auctioned spectrum

- Area-wide licenses
- Exclusive use within licensed area/frequencies
- Licensees have not deployed systems

# Utilities' Broadband Spectrum Challenge

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## Unlicensed

No construction req'mt

No interference  
protection

No areas of operation

Options

900 MHz

2.4 GHz

5.7/5.8 GHz

Equipment Available

## Hybrid/Registration

Access to 700 MHz

Public Safety/D-Block

TV White Spaces

3.65-3.70 GHz

Registration of each  
site

Technology-based  
interference  
protection

Equipment available

# Auctioned Spectrum Suitable for Broadband

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AMTS (217-218 MHz and 219-220 MHz)\*

IVDS (218-219 MHz)

700 MHz (Guard bands, A & B Blocks, & PSST/D-Block)\*

800 MHz (Combined ESMR Channels)

900 MHz ((Multiple) Narrowband PCS)\*

1.4 GHz (1392-1395 MHz and 1432-1435 MHz)\*

1.6/2.4 GHz ((ATC only) 1610-1617.5 MHz & 2483.5-2495 MHz)

2.3 GHz (2305-2310 MHz, 2310-2320 MHz and 2320-2345 MHz)\*\*

2.5 GHz (Sprint/Clearwire rural area leases maybe)

# Auctioned Spectrum Acquisition Paths

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Acquire entire license (FCC approval required)

Assignment of license (Asset Purchase Agreement)

Secondary Markets transactions (FCC approval/notice required)

Partition (Asset Purchase Agreement)

Disaggregation (Asset Purchase Agreement)

Lease and sublease (Lease Agreement)

*De facto*

Spectrum Manager

Duration and license renewal expectancy

Combinations of partitions/disaggregation and leases

# Auctioned Spectrum: Deal or No Deal

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Is auction winner interested in selling/leasing?

How do you know?

Valuation methodologies

MHz/Pop

Cost of License + agreed upon %

Valuation considerations

Remaining term of license

Aggregate amount of spectrum

Impact of secondary market transaction on value of  
remainder of licensee's spectrum

Availability of Equipment

# Auctioned Spectrum Checklist

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Date of auction/term of license

Construction obligation

Area-wide license

Use restrictions (almost always; waivers routinely granted)

Protection of site-specific licensees

“Secondary Markets” transactions

Equipment availability

# Conclusions

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## Auctioned spectrum merits

- Area-wide licenses
- Offer bandwidth to support IP-based networks for Smart Grid applications
- Available to utilities

## Auctioned spectrum realities

- Modest incentives for auction winners to make deals
- FCC aware of the auctioned spectrum dilemma, but does not have a solution
- Equipment not always available



# Thank you

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