2012 AWEA Wind Resource & Project Energy Assessment Seminar

Monetizing Wind Resource Assessment: Bank Survey

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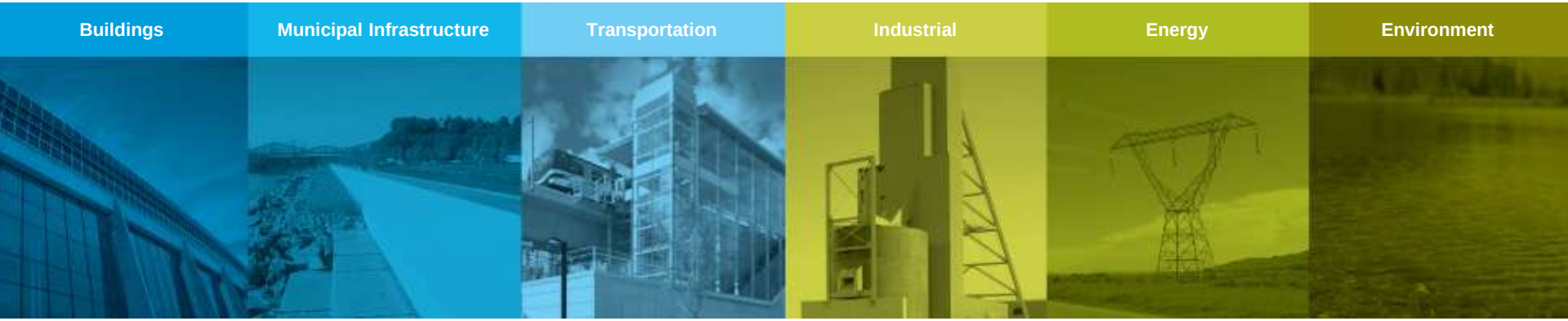

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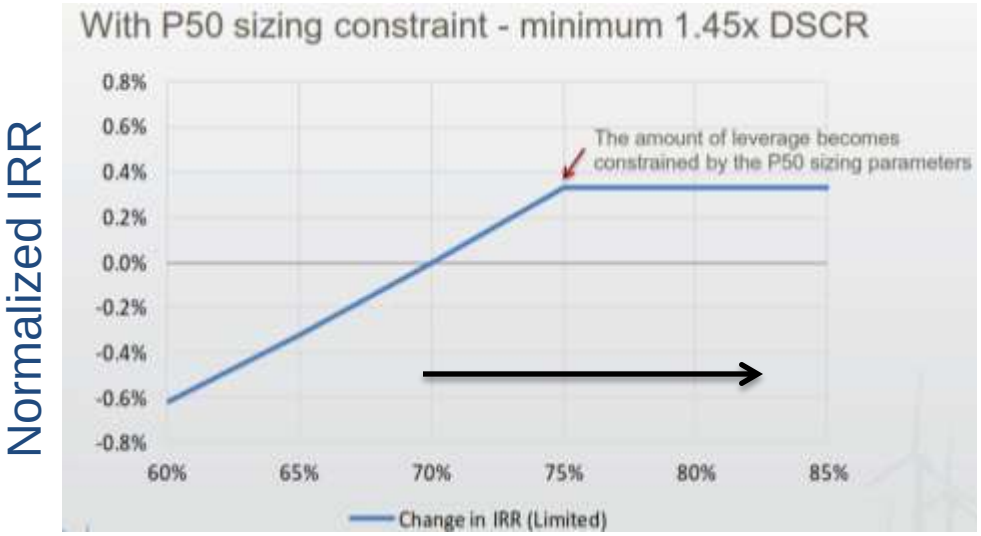
OBJECTIVES

- If I spend money on reducing project uncertainty, will it improve the value of the project?
- Quantify how *reductions* in uncertainty levels *increase IRR & NPV*
- What other factors impact the success of financing?
  - *IRR : Internal Rate of Return, NPV : Net Present Value*

REVIEW OF PRIOR WORK

- Daniela Shapiro (AWEA 2011) showed that lower uncertainty results in lower equity requirements and better returns for the developer
  - *IRR improves* as *uncertainty decreases*
  - There is a *ceiling for improvements* in IRR at a P99/P50 ratio of *~0.75*



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SURVEY OVERVIEW

- Wanted to know:
  - How does financial modeling vary within the finance industry?
  - What does it mean to developers?

- Conducted a survey:
  - Large lenders and tax equity banks, developers (anonymous)
  - Combined portfolio in the tens of thousands of MW, hundreds of projects

- Applied the survey results to a case study (100 MW project)

CASE STUDY: THE "TYPICAL" PROJECT

- Based on survey responses, we made a "typical" project

- Project Size: 100 MW
- Capacity Factor: 40%
- Power Purchase Agreement: $47/MWh escalating at 2.0%/yr.
- PTC Eligible

- 10-year standard uncertainty cases: 5%, 7%, 9%, 11%, 13%

- (1-year standard uncertainty: 7.6%, 9.0%, 10.6%, 12.4%, 14.2%)

FINANCING STRUCTURES: DEBT

- Leveraged financing means the project costs are paid for by equity and debt
  - Equity: money out of the developer's pockets
  - Debt: money borrowed from a lender (e.g. bank)

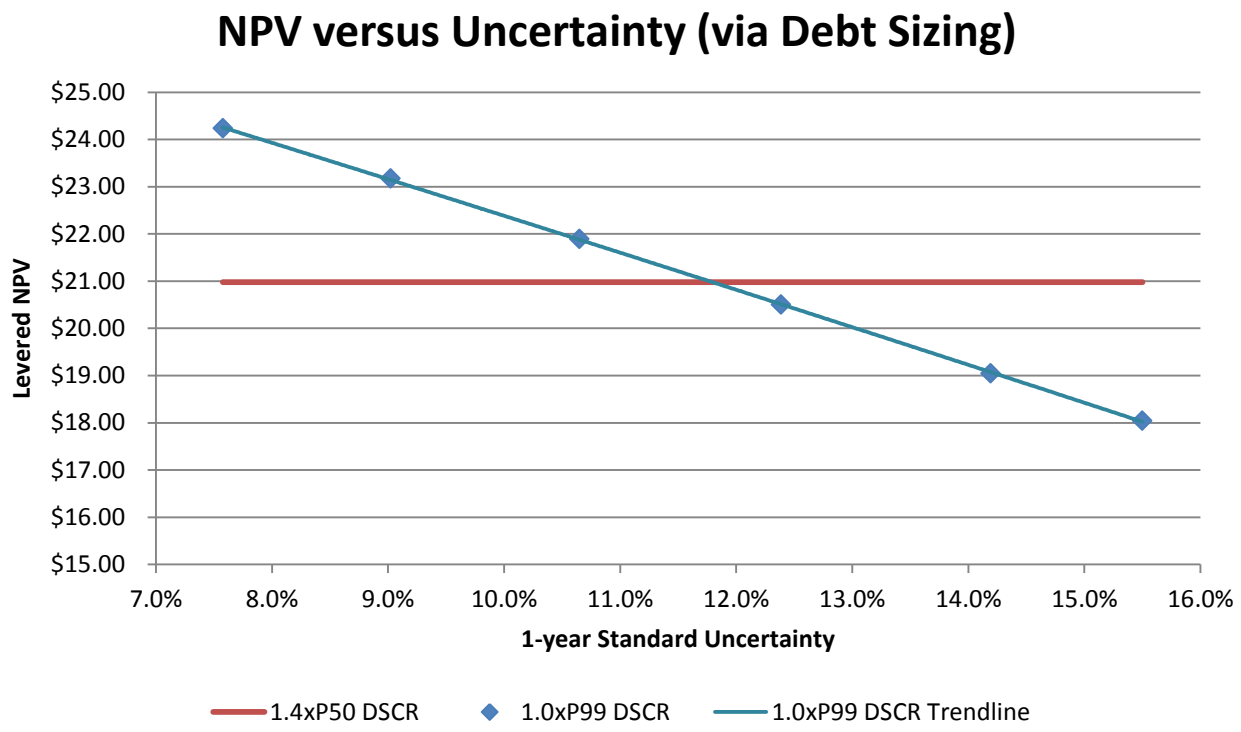
- Debt Service Coverage Ratio:

$$\frac{\text{Cash available for debt servicing}}{\text{Interest + principal payments}}$$

  - 1.0 is bare minimum: higher means less risk of defaulting on debt
  - Available cash depends on income (which depends on production)

SURVEY RESPONSES: CASE STUDY

→ Debt service coverage ratio: 1.0 for P99; 1.4 for P50



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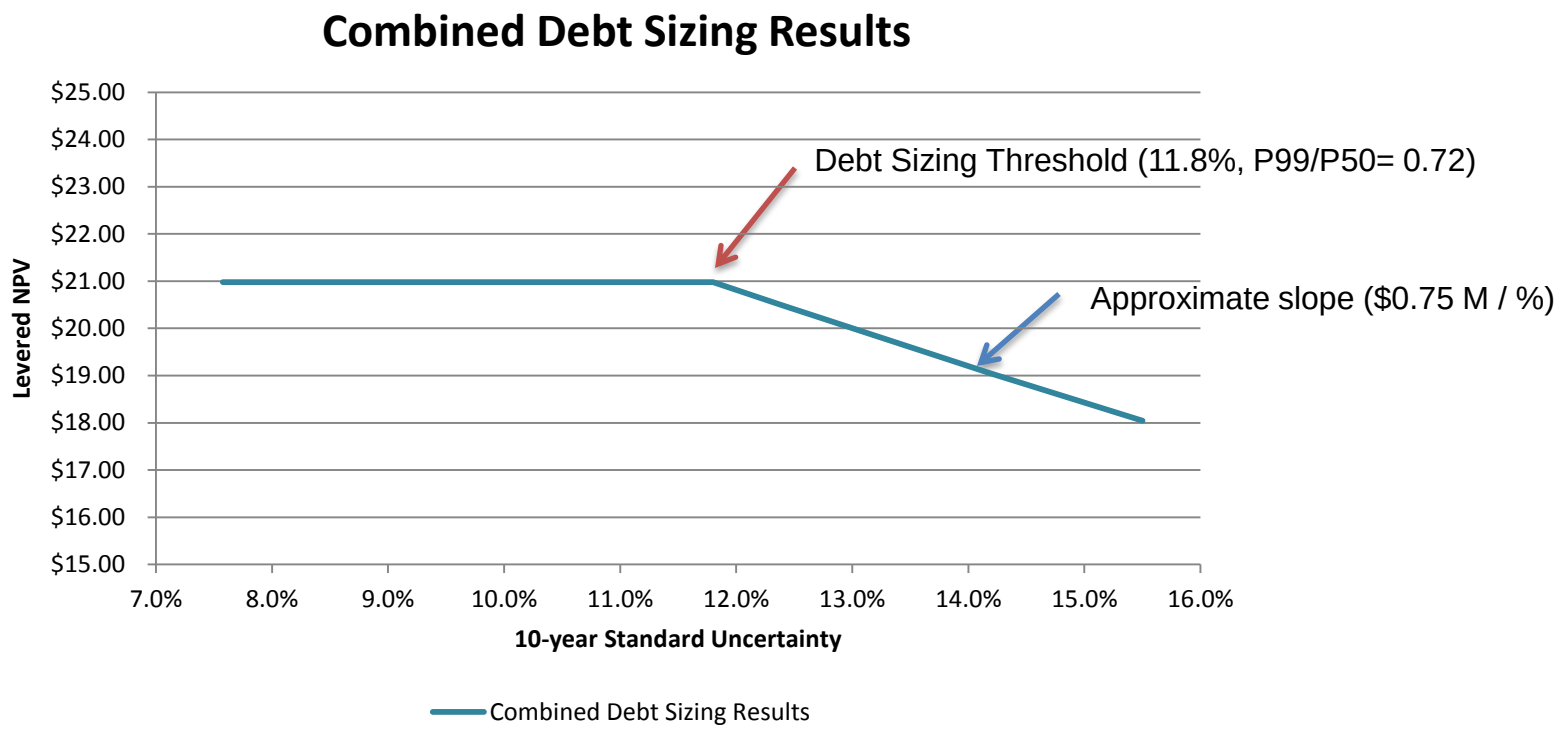
SURVEY RESPONSES: CASE STUDY

- Debt service coverage ratio: 1.0 for P99; 1.4 for P50



- Alternates: 1.45 for P50;1.0 for P90; 1.0 for P99 (10-year); 1.5 for P50; incrementing DSCR

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DEBT SIZING IMPACT

→ What's the hook?

→ For projects with uncertainty greater than 12%:

- Significant $$ left on the table ($0.75 M / %)
- In most cases uncertainty can be easily reduced below 12% (e.g., remote sensing/met tower installation)
- Relative cost for improving uncertainty is low ($40 to $50 k for a met tower, $30 to $40 k for a remote sensing campaign, $80 to $120 k for a tall tower)

FINANCING STRUCTURES: TAX EQUITY

- Production tax credit (PTC): a tax credit for producing the wind energy

- If the developer pays less in taxes than the value of the PTC, money is left on the table
- A tax equity provider pays more in taxes than the value of the PTC

- The tax equity provider owns the project until the “flip date”: the date when a specified IRR is achieved for the tax equity provider
- The developer starts earning a greater proportion of revenue after the flip date, *so the sooner the better (improved developer IRR)*

SURVEY RESULTS: TAX EQUITY SENSITIVITIES

- Tax equity is structured for a specific flip date and IRR
  - For example, the tax equity provider can require an IRR of 7.75% with a target ‘flip’ at 9 years, or 8% at 10 years (or better)

- A sensitivity test is calculated for different production confidence levels (e.g., P75, P90, P99)
  - If actual production is lower than predicted, the flip date is delayed
  - Banks have different thresholds of sensitivity: 14, 15, up to 18 years
  - An extreme case: a flip date of 20 years the structure will not work

THE COST OF UNCERTAINTY: CASE STUDY

- What are our IRR & NPV for production at P50 levels?

P50 Scenario with investor IRR @ 7.75%

Flip in Year:	9	
	Pre-tax	***After-tax***
Developer IRR	10.40%	8.55%
NPV	$ 10,780,212	$ 4,014,121

***NPV Results assume 8.5% discount rate**

- What would happen if the project under-produced?
- The banks do a sensitivity test

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THE COST OF UNCERTAINTY

→ The higher the uncertainty, the bigger the cost of under-production

P75 Production Realized (10- Year Standard Uncertainty)

		IRR		NPV*	
Uncertainty	**Flip Date**	**Pre-Tax**	***After-Tax***	**Pre-Tax**	***After-Tax***
5%	13	8.81%	7.19%	$ 1,611,562	$ (2,633,845)
7%	14	8.10%	6.59%	$ (2,047,155)	$ (5,309,679)
9%	14	7.96%	6.47%	$ (2,725,384)	$ (5,856,648)
11%	15	7.14%	5.78%	$ (6,638,539)	$ (8,718,392)
13%	16	6.46%	5.20%	$ (9,522,903)	$ (10,880,788)

*NPV Results assume 8.5% discount rate

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THE COST OF UNCERTAINTY

- What's the impact?

- The higher the uncertainty, the more severe the downside risk
  - If P75 is realized, ~$1.4 M decrease in NPV / % uncertainty
  - Investments to reduce uncertainty are low compared to the impact on project ($40 k met tower, $30 to $40 k RS, $80 to $120 k tall tower)
- Other risk factors limiting project completion are a bigger consideration for decisions regarding wind resource assessment investment

SURVEY RESULTS: SUCCESS IN FINANCING

- Banks do an internal due diligence
- Confidence in the wind resource report
  - What is the main driver of uncertainty? Can it be mitigated?
- Equipment: Turbine reputation and history
- Economic strength
  - Project size (economy of scale versus too large)
  - Reputation of the sponsor
  - Strength of the market
- Contracts
  - Who is the off-taker, credit strength, PPA terms
- Project specifics
  - Transmission, curtailment, location of the project

CONCLUSIONS

- For leveraged projects, a large monetary incentive exists for getting uncertainty below 12%
- For all finance structures, the lower the uncertainty, the lower the downside risk
- The cost to reduce uncertainty is small compared to its impact on NPV for risk scenarios

CONCLUSIONS (CONTINUED)

→ Securing financing depends on:

- Project uncertainty
- Equipment
- Sponsor reputation
- Strength of market
- PPA and contract terms
- Project specifics (other risks)

THANK YOU

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Robert Campbell, GENIVAR