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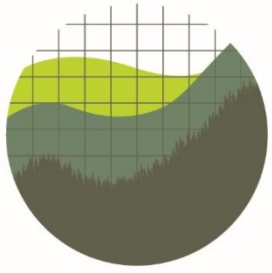
NEW YORK UNIVERSITY SCHOOL OF LAW

Carbon Pricing in Energy Markets

ACERA Webinar

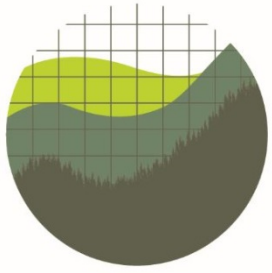
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Burcin Unel, Ph.D.



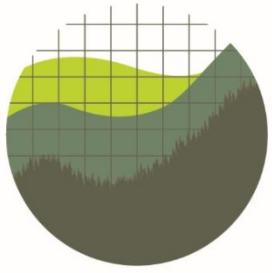
Overview

- Design principles
- Mechanics of carbon pricing
- Benefits of carbon pricing
- Case studies
 - NYISO
 - Chile
- Recommendations



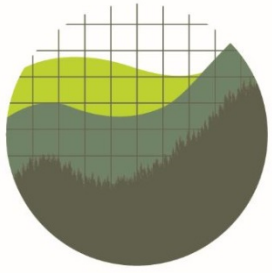
Why Carbon Pricing?

- First-best way to internalize the externality
- Is technology neutral
- Provides efficient investment signals
- Can address leakage
- Creates revenue that can be redistributed



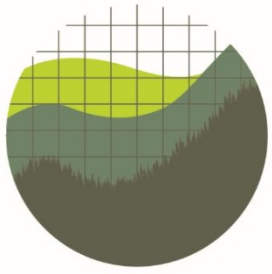
Principles for Effective Carbon Pricing

- The market price of electricity should reflect the marginal social cost of electricity generation
 - Both consumers and producers should face this price signal
 - Carbon tax should be at least as high as the Social Cost of Carbon
 - Polluters should pay for the damages caused by their emissions
- The scope of the carbon-pricing rule in an organized wholesale market design should include all producers and consumers of electricity bought and sold in that market
- If the carbon-pricing rule is incomplete it should optimally mitigate leakage



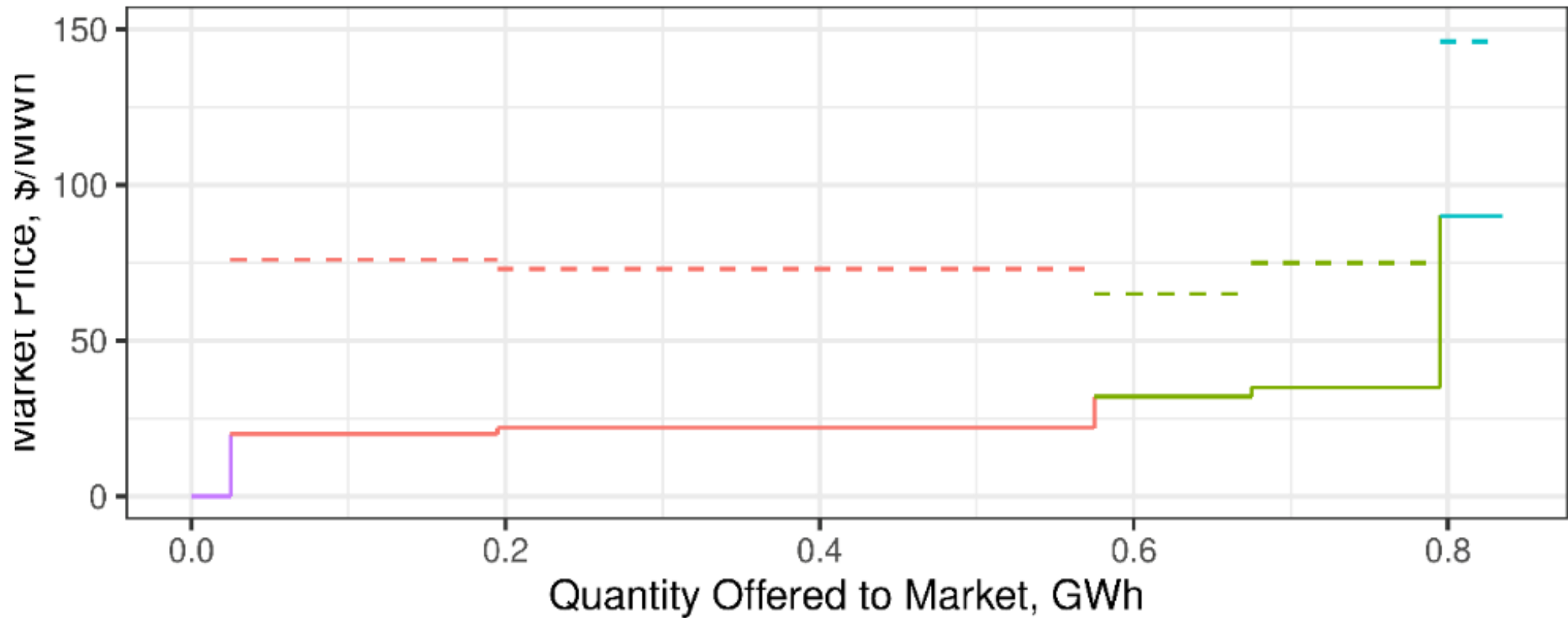
Carbon Pricing in Wholesale Markets

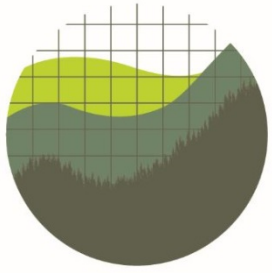




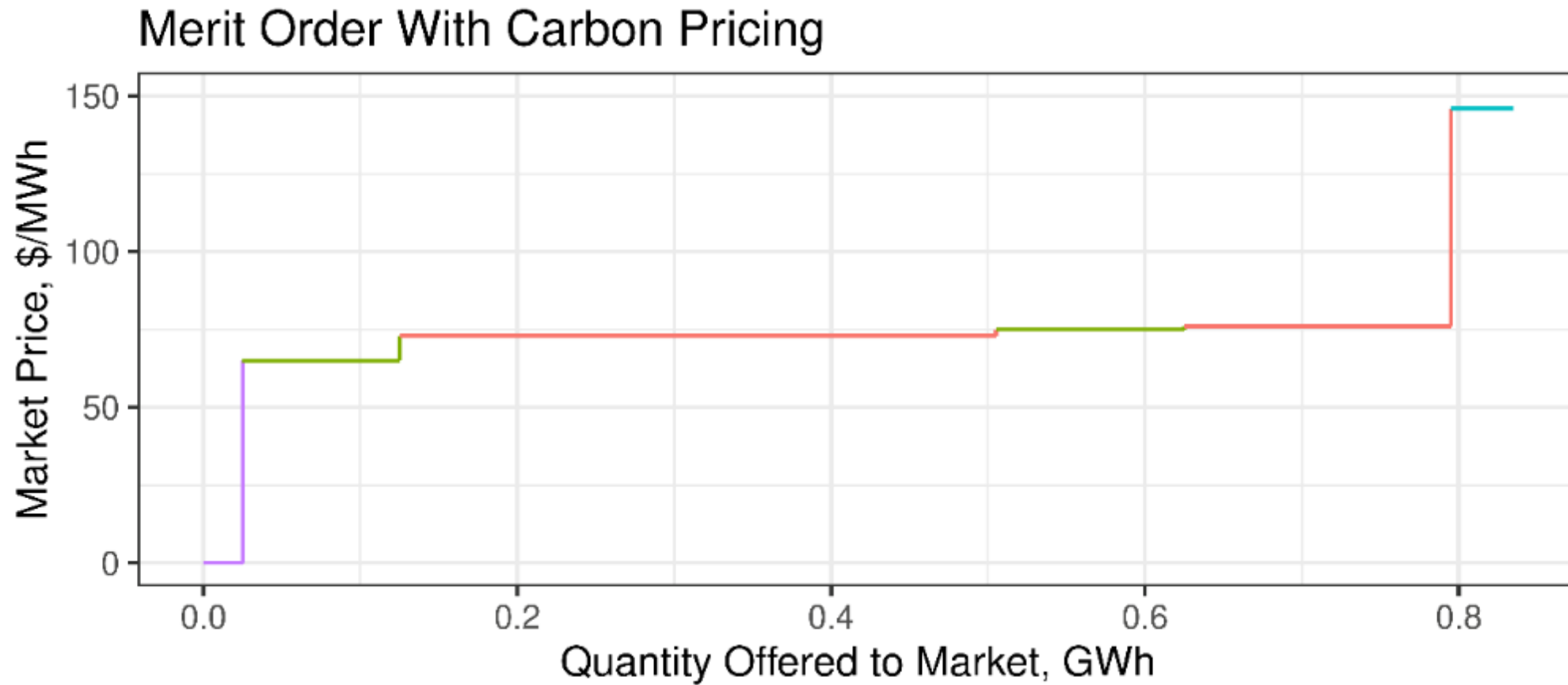
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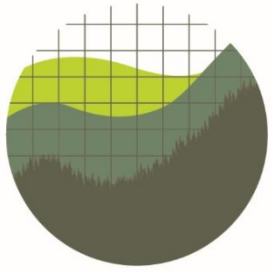
Applying Carbon Price to Generation



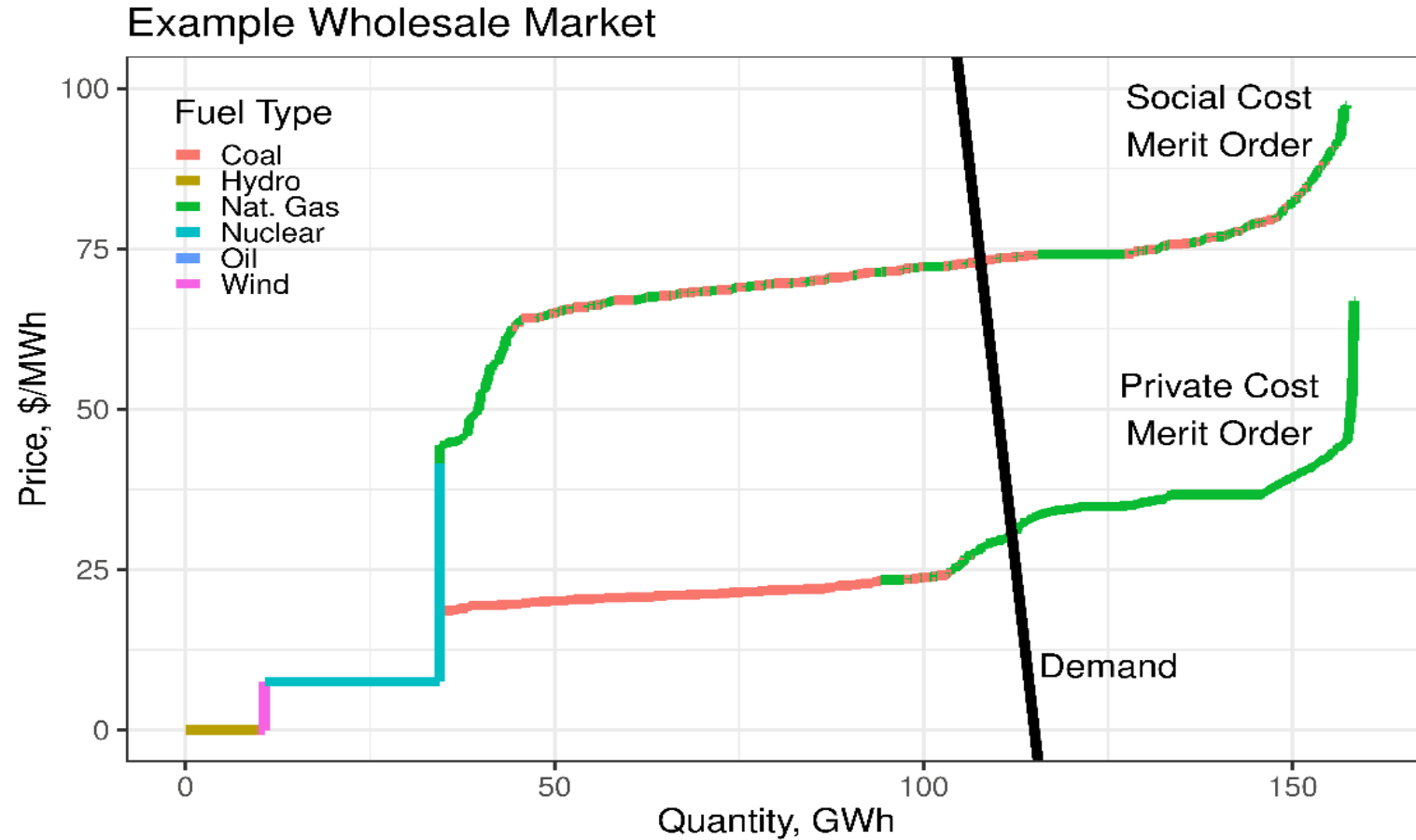


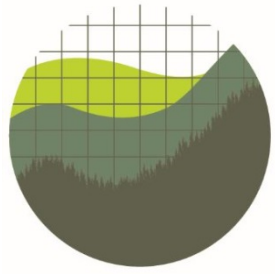
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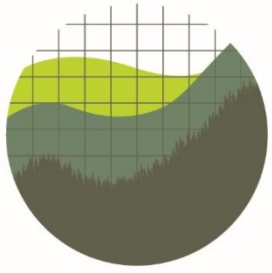
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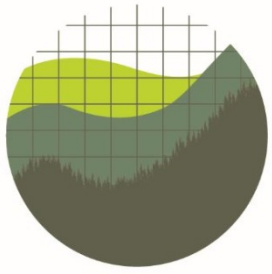
Benefits of Carbon Pricing

- **Increases costs of operating fossil-fuel resources** in proportion to their CO₂ intensity
- **Increases energy prices** to reflect the social marginal cost of electricity
- **Provides granular price signals** reflecting the social cost of electricity



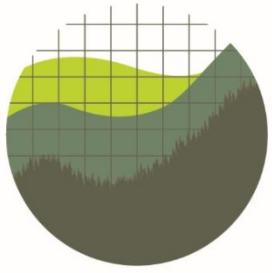
NYISO's Carbon Pricing Proposal

- New York State sets a carbon price
 - Current analysis is based on the IWG's Social Cost of Carbon – Regional Greenhouse Gas Initiative price
- Emitting generators pay for their emissions
- Cleaner resources receive higher revenues
- Any remaining carbon charge residual is credited to utilities
- Border adjustments to prevent leakage



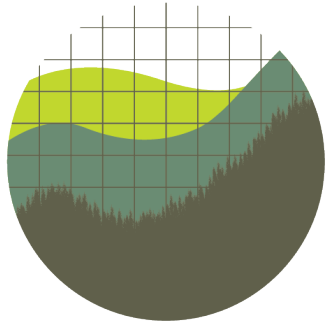
Carbon Tax in Chile

- Price
 - \$5 per metric ton
- Pass-through restrictions
 - Tax is not considered in dispatch
- Side payment rules
 - Any tax that cannot be covered by spot prices must be socialized



Recommendations

- A price level and a rate of increase that is more aligned with the Social Cost of Carbon
- Economic dispatch based on the social marginal cost
- Polluters should pay based on their emissions



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Thank you!

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