Introduction to Feed-in Tariff Rate Setting Approaches

Wilson Rickerson
Meister Consultants Group

MEISTER CONSULTANTS GROUP

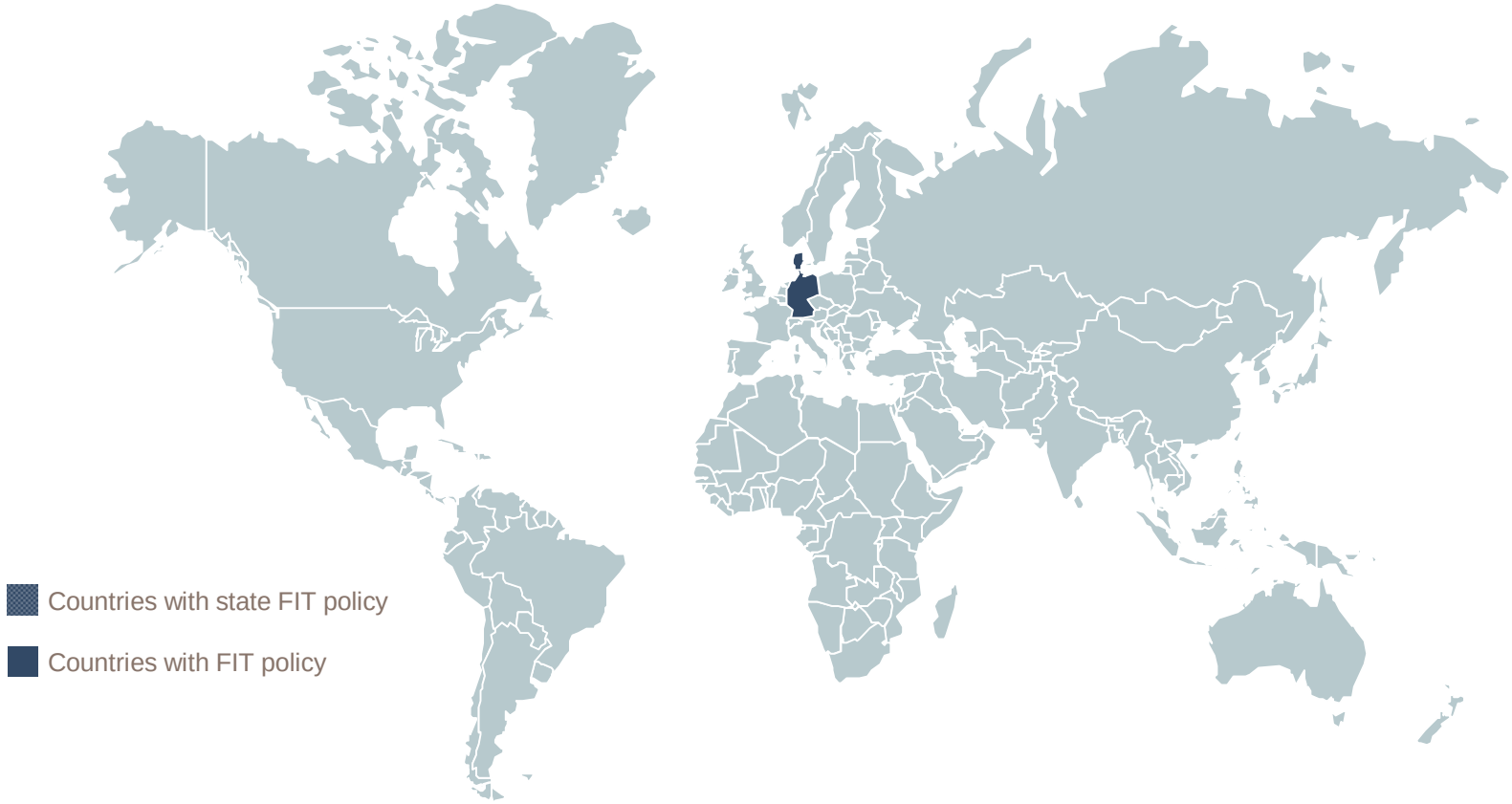
The Presentation Outline

A. Feed-in tariffs around the world

B. Rate Setting Process and Methodology

C. A Potential Starting Point

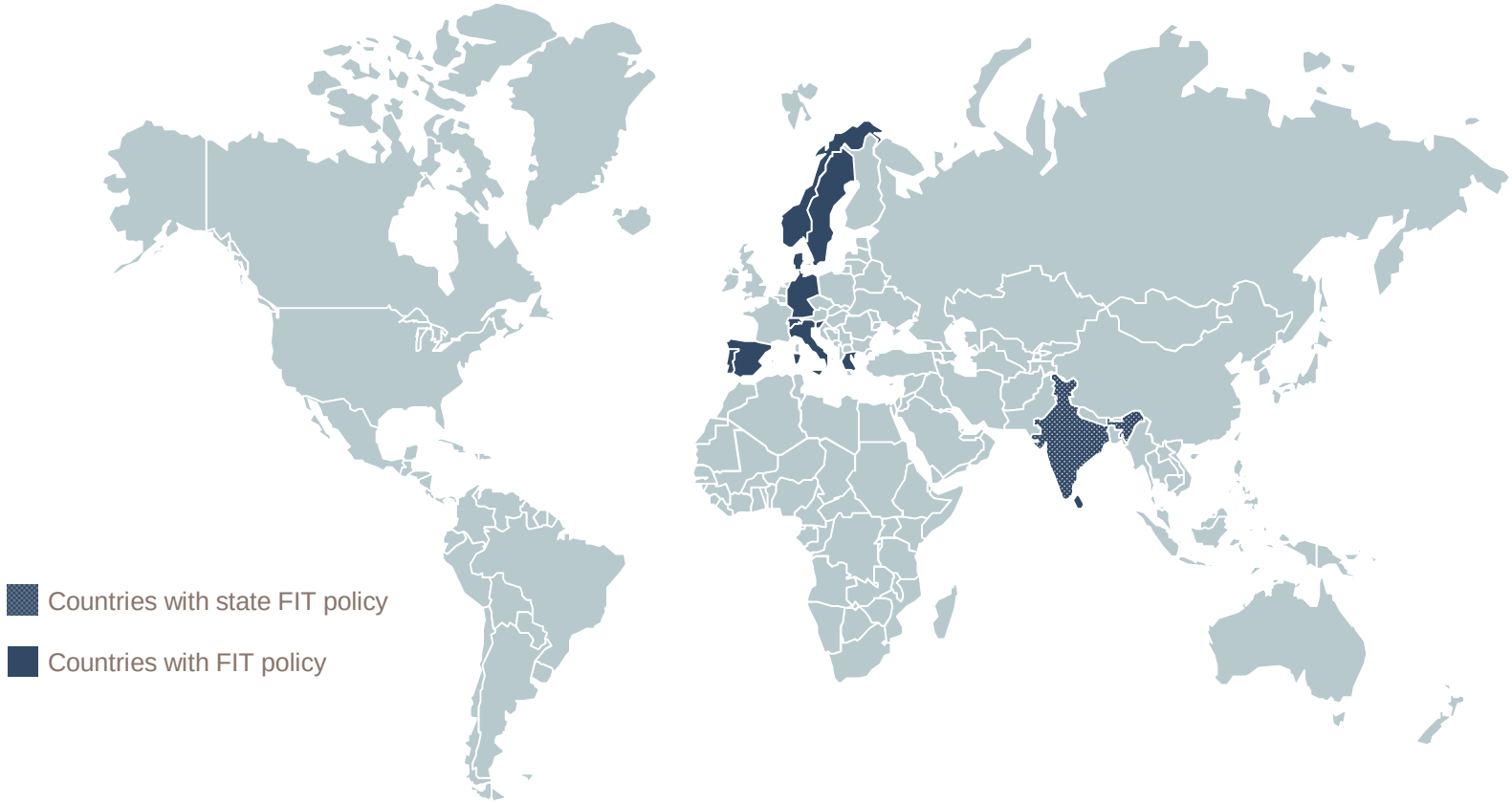
FIT Countries 1990



Source: REN21, Renewables 2010 Global Status Report

MEISTER CONSULTANTS GROUP

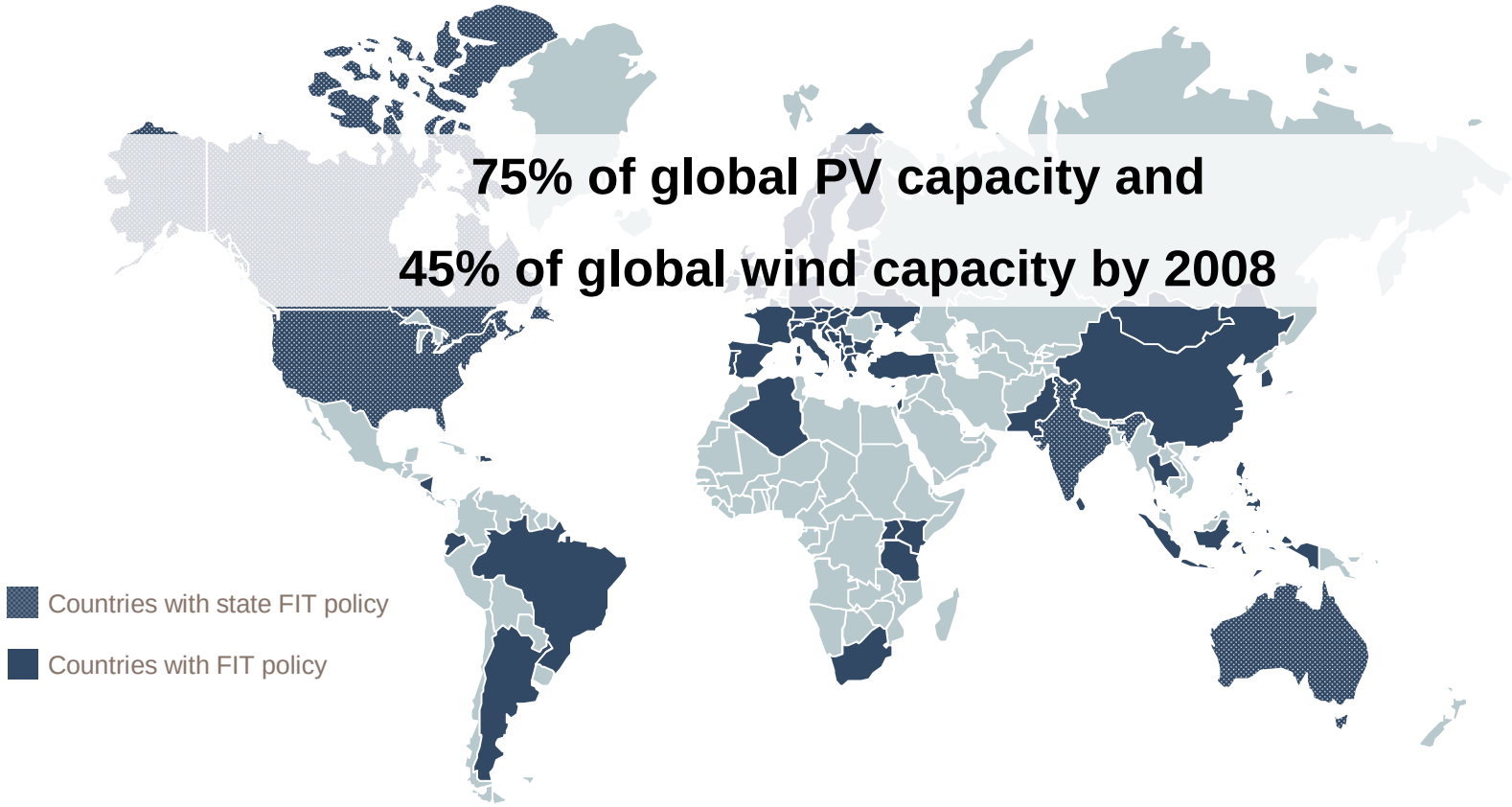
FIT Countries 2000



Source: REN21, Renewables 2010 Global Status Report

MEISTER
CONSULTANTS GROUP

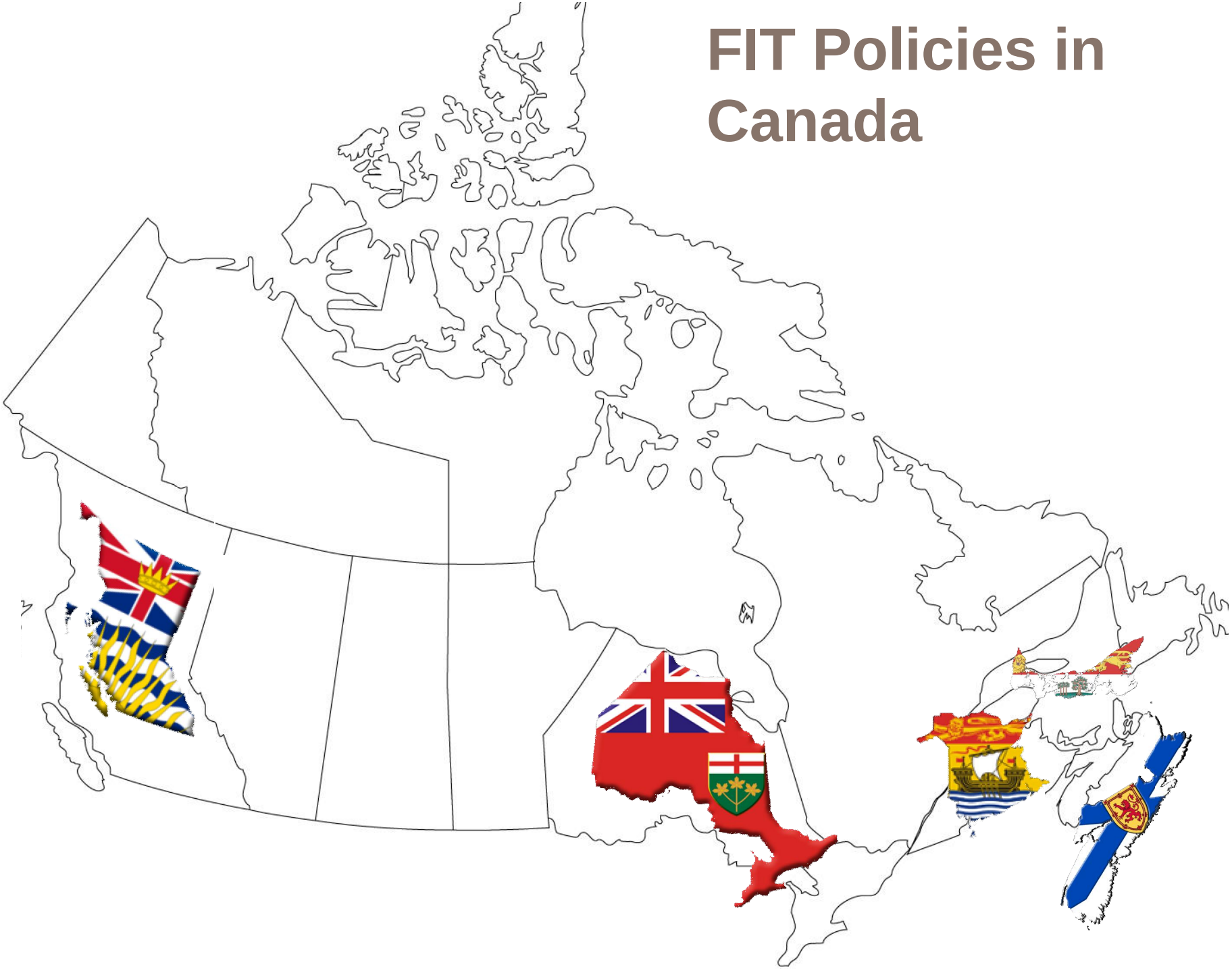
FIT Countries 2010



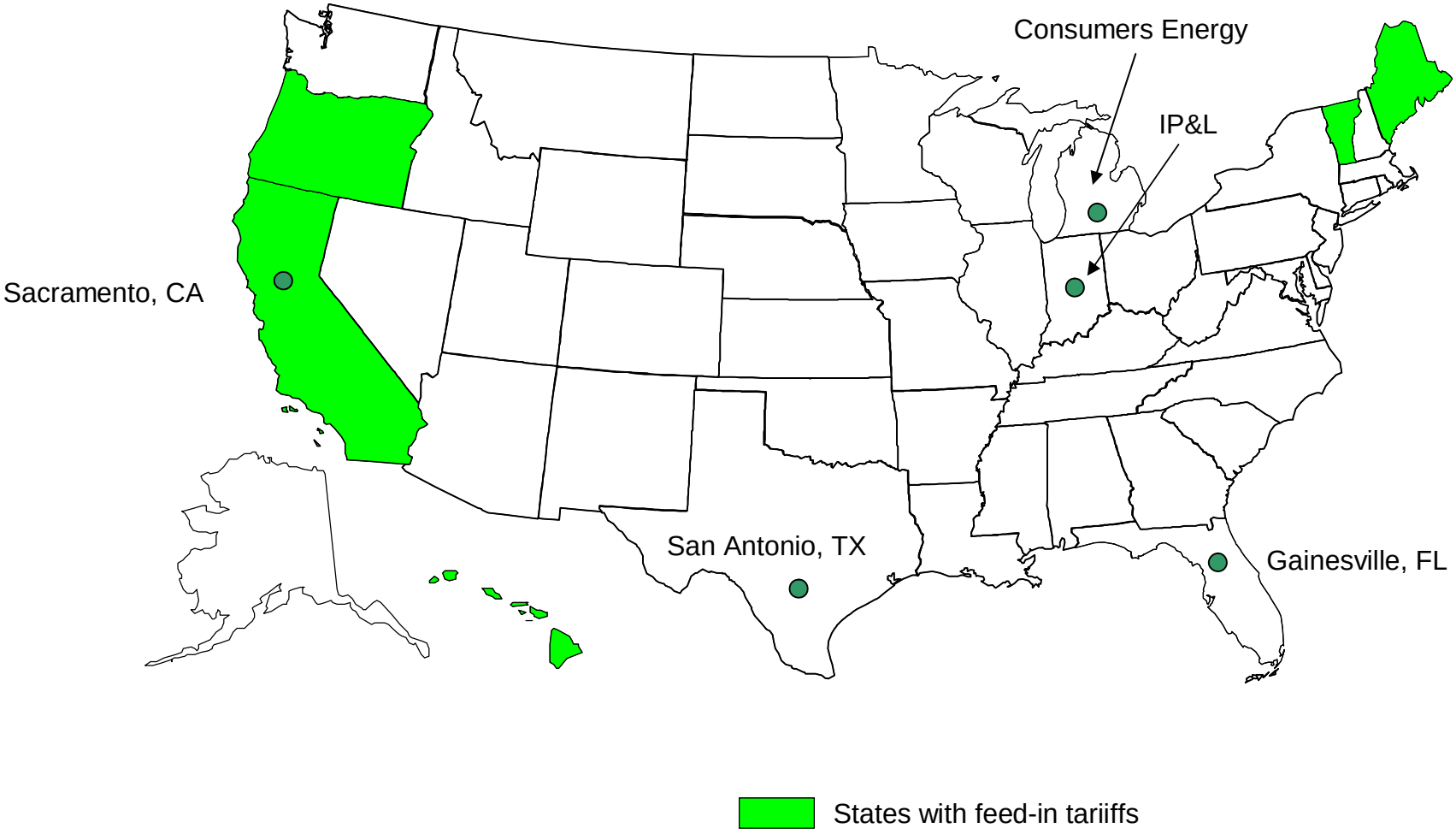
Source: REN21, Renewables 2010 Global Status Report

MEISTER CONSULTANTS GROUP

FIT Policies in Canada



FIT Policies in the U.S.



Defining Feed-in Tariffs (FITs)

Feed-in tariffs provide guaranteed access to a performance-based, long-term revenue stream from a creditworthy buyer.

- Precise definition is elusive
- Administratively set rates
- FITs can include interconnection, purchase, and dispatch rules

The Presentation Outline

A. Feed-in tariffs around the world

B. Rate Setting Process and Methodology

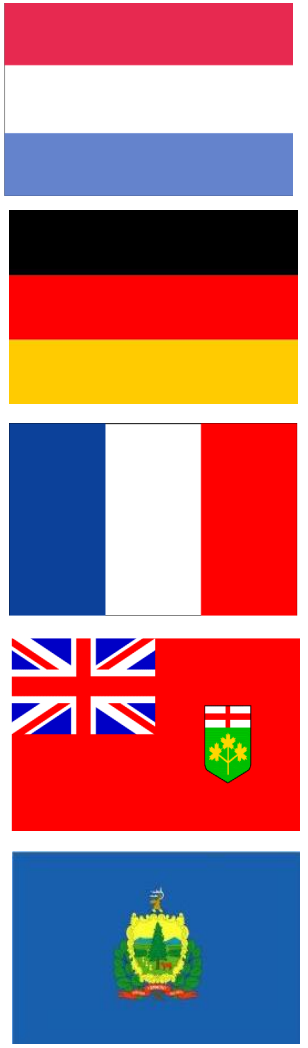
C. A Potential Starting Point

No need to re-create the wheel!

In-depth survey of FIT rate setting in:

- The Netherlands
- Germany
- France
- Ontario
- Vermont
- Gainesville, FL

=



MEISTER CONSULTANTS GROUP

CITY OF GAINESVILLE 1869 STATE OF FLORIDA

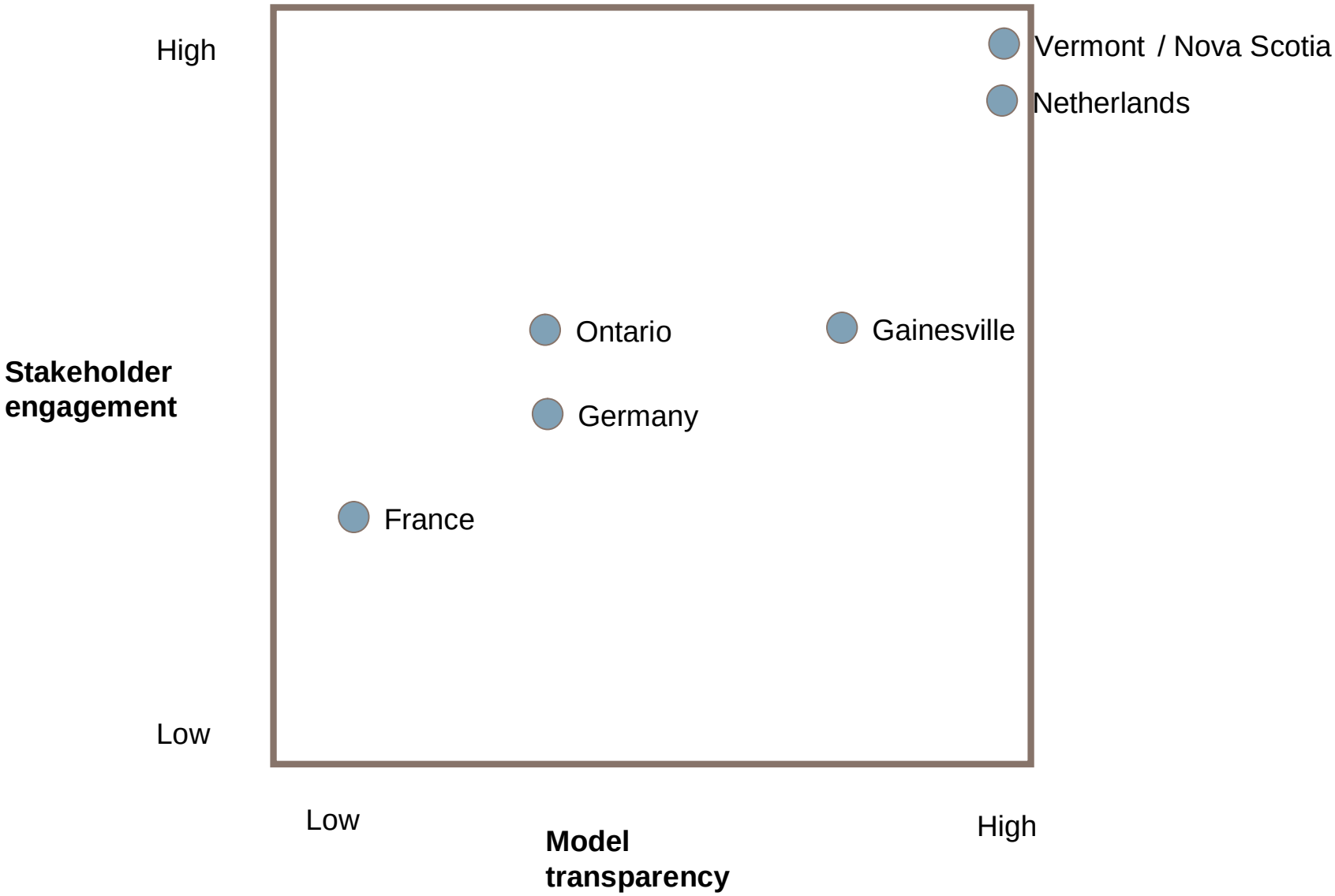
Rate setting review process

- Review of rate setting process
  - What is the process by which rates are proposed and then implemented?
  - How are stakeholders consulted during the process of rate setting?
  - How transparent is the process?

- Review of rate setting models
  - What type of analysis does the model employ?
  - What inputs does the model rely on?
  - How complex is the model?
  - What type of data does the model utilize?

- Would any of the models serve as a useful starting point for Nova Scotia?

Rate setting process transparency



Building a feed-in tariff rate calculator

- Goal is to reach an appropriate rate that is high enough to spur renewable energy development while at the same time not so high as to provide windfall profits to project owners.

- Tradeoffs exist:
  - Ease of use vs. complexity
  - High-level representation vs. detailed analysis
  - Granularity vs. time investment
  - Transparency vs. precision

Rate setting models: A few examples

- **Germany.** Considered the gold-standard of FIT design. Employs a complex model in a comparatively non-transparent process.

- **Ontario.** Draws on lessons from European feed-in tariffs and shares design characteristics with Germany. Employs a confidential model.

- **Vermont.** First state-based FIT in the US. Employs a publicly available model, developed through a transparent regulatory process

Tariff Differentiation

	Ontario	Vermont	Germany
Degree of Tariff Differentiation	High (e.g., tech-nology and size differentiation)	Medium (e.g., technology differentiation; limited size differentiation)	High (e.g., technology and size differentiation)

Source: Gifford et al, 2010

Input complexity

	Ontario	Vermont	Germany
Data granularity	***Capital Costs*** -One input for installed costs ***Operating Costs*** -Variable O&M -Fixed O&M -Other costs -Fuel costs -Property tax	***Capital Costs*** -Debt reserve -Maintenance reserve -Working capital -Financing costs -Installation costs ***Operating Costs*** -Varies by technology -10 to 12 input cells available in the model (labor, insurance, staffing, etc.)	A highly detailed listing of capital and operating costs`

Source: Gifford et al, 2010

MEISTER CONSULTANTS GROUP

How do they analyze their data?

	Ontario	Vermont	Germany
Granularity of Data Sources	Top-down	Top-down	Bottom-up

Source: Gifford et al, 2010

Where do they get their data?

	Ontario	Vermont	Germany
Data Sources	- Market research - Publicly available data - Industry polling - Workshops	-Regulatory process using expert testimony -Publicly available data and models -Data submitted by industry	-In-depth surveys conducted by research institutes - Data collected from generators that receive FIT rates

Source: Gifford et al, 2010

Rate setting methodology

	Ontario	Vermont	Germany
Methodology	Discounted cash flow	Discounted cash flow	Fixed charge rate ("Annuity method")

Discounted cash flow:

• Calculates the net present value and rate of return of an investment based on the projected revenues and expenses

• Pros:

  • Can take into account time-sensitive events such as major equipment repairs or replacements

  • Easily structured to take tax benefits (depreciation, tax credits) into account

  • Highly transparent

Recovery factor analyses:

•Method relies upon a single factor (i.e., a multiplier) to convert capital investment–related costs to an annual figure. Cost of energy is calculated by multiplying the initial investment by the recovery factor, dividing this value by the estimated annual production, and adding a simplified estimate of operating expenses in a representative year. Fixed charge rate is a type of recovery factor analysis.

Pros:
• Simplified calculations

Source: Gifford et al, 2010

Tax assumptions

	Ontario	Vermont	Germany
Tax Treatment	After tax	After tax	Pre-tax

Source: Gifford et al, 2010

Capital Structure

	Ontario	Vermont	Germany
Capital Structure	Fixed (70/30 debt/equity)	Varies by technology. (Ranges from 75/25 for farm methane to 30/70 for 100 kW wind)	Varies by technology

Source: Gifford et al, 2010

Treatment of Other Incentives

	Ontario	Vermont	Germany
Other Incentives	None	- 30% federal ITC for all but farm methane -Portion of state tax credit assumed for all but farm methane	None

Source: Gifford et al, 2010

The Presentation Outline

A. Feed-in tariffs around the world

B. Rate Setting Process and Methodology

C. A Potential Starting Point

Vermont's FIT

- Launched in 2009
- Program cap of 50 MW
- Project size cap of 2.2 MW
- Resources:
  - PV
  - Wind
  - Landfill gas
  - Small hydro
  - Biomass
- Contract term: 10-25 years

MEISTER
CONSULTANTS GROUP

Vermont FIT Rate Framework as a Starting Point?

- Readily available and easily altered
- Vetted through transparent stakeholder process
- Represents consensus between utility, industry, and regulatory staff
- Online record of stakeholder comments and regulatory decisions
- Flexible for use with different ownership structures, technologies and financing options
- Comparatively recent development of model reflects latest thinking on rate setting

MEISTER
CONSULTANTS GROUP

Wilson Rickerson

(617) 934-1676

wilson.rickerson@mc-group.com

www.mc-group.com