

# Grading North American Feed-in Tariffs

By Paul Gipe

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How do existing North American feed-in tariff programs stand up to best practices worldwide? How well do they compare to, say, programs in Germany or France? What programs are world-class? What programs are laggards? What programs fail to make the grade and are poor imitations of successful policies elsewhere? What innovations have North Americans contributed to what has become the worldwide policy of choice for developing renewable energy? These are all questions that need to be answered as policy makers look for guidance on how to design programs that not only work, but are also fair and equitable to ratepayers. This essay examines and grades North American feed-in tariffs. Some excel, some pass, and many fail in comparison to best practices worldwide.

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# Introduction

Feed-in tariffs are the world's single, most successful policy for the rapid development of renewable energy. Countries with a combined population of more than one-third of the globe's six billion people are using or will soon use some form of feed-in tariffs.

In their most basic form, feed-in tariffs are simply payment to generators of renewable energy for each kilowatt-hour of electricity they produce, whether from a solar Photo Voltaic (PV) system on a rooftop or a wind turbine on a farm.

Since the first simple feed-in tariff was used in California in the early 1980s, the policy has been continually refined from one political jurisdiction to the next. Today, advanced systems of Feed-in Tariffs (FITs) are used as a stand-alone policy for developing renewable energy, or they are used as the principal mechanism for achieving renewable energy targets.

Feed-in tariffs go by many different names, but the policies they represent have driven Germany and Spain in particular to world leadership in renewable energy development.<sup>1</sup>

The movement for using feed-in tariffs in North America has gained increasing momentum since 2004 when the Ontario Sustainable Energy Association (OSEA) launched its campaign for Advanced Renewable Tariffs in the Canadian province of Ontario. Today there are more than a dozen different jurisdictions in Canada and the US using a form of feed-in tariffs or considering them.

The media "buzz" around feed-in tariffs and their growing popularity have led to a rash of proposals across the continent. However, not all feed-in tariffs are created equal. Some are good, and some are so weak as to be ineffective.

Consequently, as feed-in tariff programs proliferate and the policies proposed become more complex in response to ever increasing demands, there is a need to weigh the importance of various provisions that have been used in successful policies. Several sources have published (or are in development) best-practice guidelines to inform policy makers and advocates alike on how best to design successful feed-in tariffs.<sup>2</sup>

How, then, do existing North American feed-in tariff programs stand up to best practices worldwide? How well do they compare to, say, programs in Germany or France? What programs are world-class? What programs are laggards? What programs fail to make the grade and are poor imitations of successful policies elsewhere? What innovations have North Americans contributed to what has become the worldwide policy of choice for developing renewable energy? These are all questions that need to be answered as policy makers look for guidance on how to design programs that not only work, but are also fair and equitable to ratepayers.

Just as teachers once graded us on our mastery of math or geography, we can weigh the importance of various features of successful feed-in tariff programs and assign a numeric grade. Any grading system is arbitrary, but such a system can be useful in gauging progress or in identifying weak programs where greenwashing masquerades as policy. A grading system can also be helpful in showing where improvements need to be made in particular programs.

Of course, there are not many places where systems of Advanced Renewable Tariffs exist in North America. Even so, there are several states and provinces with programs that they at least identify as feed-in tariffs. And there are several states with proposed legislation or regulatory dockets where feed-in tariff policies are under discussion.

We can begin with those programs that are already successful, those in Germany, France, and Spain. They are the top of the class. They set the gold standard for comprehensive systems of feed-in tariffs called Advanced Renewable Tariffs to distinguish them from earlier, simpler programs.

Designing successful public policy is never easy, nor without controversy. Moreover, no jurisdiction gets it right the first time. There is a natural progression of development as objectives change and new problems arise. So it is useful to remember that Germany launched its first system of feed-in tariffs in 1991. The program that has made Germany famous, the system of Advanced Renewable Tariffs, began in 2000 and has been revised every four years since. The Germans have had a decade to get it right.

France launched its program in 2001 and has revised its tariffs twice since. Similarly, Spain's program began in 2004 and was revised in 2007 and in again in 2009.

## Criteria

Academics and policy analysts have identified several elements that need to be considered in designing successful renewable energy programs.

- Program caps
- Project size caps
- Contract terms
- Technologies included
- Tariffs based on cost of generation
- Tariffs differentiated by technology
- Tariffs differentiated by size or application for each technology
- Tariffs differentiated by resource intensity for wind energy
- Inflation indexing

In addition there are some uniquely North American provisions that need to be considered.

- Multiple tariff tracks for generators with or without access to subsidies
- Bonus payments or adders for social benefits such as community development

## Access and Connection

All successful programs require access to the grid and the certainty that the electricity produced by renewable generators will be purchased. For this reason, the law creating the German system of Advanced Renewable Tariffs, the Renewable Energy Sources Act, is subtitled “the law on granting renewable energy priority.”

The situation in France illustrates the importance of access to the grid and connection policy in determining the pace of renewable energy development. France has one of the best systems of feed-in tariffs in the world, but development has lagged well behind that of Germany and Spain.<sup>3</sup> This is partly due to more restrictive siting policies in France than in Germany and Spain, but is predominantly due to a huge backlog of connection requests. The connection backlog has slowed growth significantly.

Unlike the dense transmission and distribution network in Europe, the grid in North America is more dispersed. As a consequence, the process for assigning grid capacity in North America – who gets to connect and who does not – will be more complex than those in Europe and will vary by jurisdiction.

Though the connection application process is critical to renewable energy development and to the success of many of the ancillary program goals, such as job creation and community economic development, connection policies will vary by jurisdiction. No standardized grading system can fairly weigh all the possible provisions that may work under the laws and administrative policies of one jurisdiction, but may not work in a neighboring jurisdiction.

## Scoring

While the importance of some criteria may be obvious, that of others may be more obscure. In general:

- Programs without program caps are superior to those with caps.
- Programs without project-size caps are superior to those with caps.
- Programs with longer contract terms are superior to those with limited contract periods.
- Programs with more technologies are better than those designed for only one technology.
- Programs with tariffs based on the cost of generation are superior to those based on avoided cost.
- Programs with more differentiation in the tariffs are better than those with only one price.
- Programs with sufficient inflation indexing are better than those with few or no inflation adjustments.

For programs in the US, there is also a need to accommodate the federal tax subsidies. Some can use them, but many cannot. Thus, US programs that create two different tariff tracks (one for those that can use the federal tax credits, and another for those that cannot) are better than those programs with only one set of tariffs intended to work only with the federal tax credits.

For most criteria there is a possible total of ten points. Thus, most criteria are given equal weight. There are two exceptions: the level of tariff differentiation within a technology, and inflation indexing.

The principal feature of successful feed-in tariff programs – the heart of systems of Advanced Renewable Tariffs – is that tariffs are differentiated by size or application for each technology. This is the one feature that separates modern policies like those of Germany and France from those of the past. For this reason, tariff differentiation by size or application is assigned 20 points.

The importance of inflation indexing is less clear-cut. Germany does not adjust for inflation within a contract, whereas France and Spain do. Germany has certainly been successful without any inflation indexing within its contracts. To reflect the uncertainty around inflation indexing for tariffs within a contract, this feature is given a weighting of six points.

### Program caps

Programs without administrative caps are invariably more successful than those with low capacity or generation caps. Industry, investors, and the financial community can scale up their operations when it is clear that the market is large and will expand rapidly. If there are caps, especially if there are low ones, businesses will essentially take a pass on making the long-term investments necessary to drive rapid development and cost reductions needed to make programs successful.

Germany has no administrative cap on its program. France and Spain have such high caps that they effectively act as no cap in the short term. Ontario's new program also has no regulatory cap.

- None: 10
- High: 8
- 10% to 20% targets: 6
- 5% to 10% targets: 4
- < 5% targets: 2
- < 1% targets: 0

### Project size caps

Similarly, programs with no project size limitations are more successful than those that try to limit project size. Germany has no limit on project size, nor does France on wind energy. Spain limits project size to 50 MW under the fixed tariff program.<sup>4</sup> France limits solar PV projects to 12 MW. The French limit has nothing to do with trying to limit the cost of solar PV on the French system; it is an historic artifact in French electricity law, dating from the post-war period.

Ontario's Standard Offer Contract (SOC) program limited contracts to 10 MW. This was a holdover from Ontario's interconnection policy and was found to be unduly restrictive to wind energy and hydro development.

- None: 10
- High: 8
- < 20 MW: 6
- < 10 MW: 4
- < 5 MW: 2

## Contract terms

The length of contracts offered under feed-in tariff policies influence the tariff that must be paid for profitable operation. Shorter contracts require higher prices than longer contracts to achieve the same level of profitability. Higher prices will have a greater effect on the immediate costs to ratepayers in the short term. Thus, it is better to pay for long-lived renewable energy projects, such as solar or wind plants, over 20 years or more to minimize the impact on ratepayers.

Contracts are typically 20 years or more in length. In Germany, contracts are for 20 years. In Spain, contracts cover 20 years for wind energy, and 25 years for solar PV. In France, contracts for wind are 15 years in length while those for solar PV are for 20 years.

- 20 to 25 years: 10
- 15 to 20 years: 8
- 10 to 15 years: 6
- 5 to 10 years: 4
- < 5 years: 2

## Technologies included

True renewable energy policies go beyond providing tariffs only for popular technologies such as wind and solar energy. They should include all or nearly all renewable energy technologies. Feed-in tariffs, especially systems of Advanced Renewable Tariffs, include as many technologies as reasonable. For example, there is no need to include a tariff for wave energy in land-locked Iowa. However, a program for Iowa should include at least wind, solar PV, hydro, biogas, and biomass. Policies for a geographically diverse country like Spain also include CSP (Concentrating Solar Power), and geothermal power generation.

- More than 5 technologies: 10
- Five: 8
- Four: 6
- Three: 4
- Two: 2
- One: 1

## Tariffs based on cost of generation

In traditional regulated markets, electric utilities are paid for their cost of generation plus a reasonable profit. Successful feed-in tariff policies use the same principle. The difference is that unlike the traditional system, where a regulatory commission negotiates with an electric utility after the plant has been built to determine a fair payment, the feed-in tariff policy sets a fair and equitable tariff before a project is built. The feed-in tariff policy says, effectively, that if you can build your project and operate it at this price, then we will pay you this amount. A public authority – whether a legislature or a regulatory commission – determines a tariff that is fair and equitable to all parties, through a transparent public process.

The tariff must be sufficient to cover all costs as well as provide a reasonable profit for a particular technology. The degree of profit determines the rate of growth. When the profit is too low, development will lag.

Successful feed-in tariff policies, such as those in Germany, France, and Spain, base their tariff calculations on the cost of generation plus a reasonable profit.

Other approaches have been used to set feed-in tariff prices. One is to base the tariff on the value of the electricity to the system. This is an awkward attempt to find a tariff that will work for solar PV, a technology that is more expensive than wind energy. In all cases to date, basing a tariff on its value has been insufficient to pay for the development of solar PV projects.

The least effective method is to base the tariff on the cost of a conventional fossil-fueled power plant that would be “avoided” by installing renewable energy. Unlike successful programs where the tariffs are determined by the specific characteristics of each renewable energy technology, “avoided cost” tariffs are determined by the characteristics of a conventional technology.<sup>5</sup> Tariffs based on avoided cost are not renewable energy policy; they are fossil-fuel policy with a provision for “allowing” renewable energy to participate.

Policies in Germany, France, and Spain calculate tariffs that are specific to each technology and based on costs specific to each technology in each country. And each country determines what it considers a reasonable profit for each technology.

- Cost of Generation: 10
- Value: 4
- Avoided Cost: 2

### **Tariffs differentiated by technology**

Successful programs differentiate tariffs by technology. There is one price for wind energy, another for solar PV, and so on. The least successful programs are those that post only one price for all technologies under all conditions.

Some programs vary the tariff by the time of day, to reflect the perceived value of the electricity to the system. Such programs are far less effective than those that base the tariffs on the cost of generating the electricity. Tariffs varying by time of day require a sophisticated analysis to estimate how much a generator will be paid over time. Worse, generators will not know beforehand how much they will actually be paid – only after the fact. Projects using these tariffs are difficult to finance because the revenue stream is unknown.

- Technology differentiation: 10
- Time of day: 4
- “One-size fits all”: 2

### **Tariffs differentiated within each technology**

Renewable energy projects have many different applications and come in many different sizes. Programs designed to encourage development in many different categories differentiate tariffs within each technology by size, ownership, location, or some other distinguishing factor.

It follows naturally that if tariffs are based on the cost of generation plus a reasonable profit, then tariffs will vary among different classes of installations within a technology. For example, rooftop solar PV is more expensive than ground-mounted solar PV and therefore the tariff for rooftop PV

will be higher than that for a ground-mounted system. Similarly, small systems do not have the economies-of-scale of larger systems, so tariffs will be higher than those of large projects.

Germany differentiates tariffs for solar PV generators according to whether the system is installed on a rooftop or on the ground. Tariffs for rooftop solar PV are further differentiated by size into four classes, with systems less than 30 kW receiving the highest tariff and systems greater than 1,000 kW receiving the lowest.

Some have called this kind of detail within each technology band “granularity.” It is a mark of a sophisticated program where great pains have been taken to calculate the tariffs needed for various kinds of projects. The intent is to create equitable opportunity for projects of all sizes in as many different applications as possible, while not paying too much for some and too little for others.

France, for example, has two sets of tariffs for most technologies. One set applies to continental France and another set applies to its overseas territories, where the cost of generation is considerably higher than on the continent.

There are typically two tranches within each technology in Spain, far fewer than in France and Germany.

Ontario’s new feed-in tariff program has two tariffs for wind energy (onshore and offshore), five tranches for solar PV, and five tranches for biogas.

Programs with granularity in three or more technologies are awarded the highest score, while those with no differentiation receive the lowest.

- Three or more technologies with three or more tranches each: 20
- Two technologies with three or more tranches each: 16
- Within two technologies: 12
- Within one technology: 8
- No differentiation: 4

### **Tariffs differentiated by resource for wind energy**

Probably no part of modern feed-in tariff programs is as misunderstood as basing tariffs on resource intensity. Tariffs differentiated by resource intensity have, until recently, been applied only to wind energy, where it is critical to equitable programs. The principle will now be applied to one tranche of solar PV tariffs in France.

The cost of wind energy in particular is determined by the strength of the wind resource where the wind turbines are located. Wind generation is proportional to the cube of the wind speed. Slight differences from one region to another can have significant impact on the amount of electricity produced. Thus, the cost of generation from wind turbines in windy areas is lower than in less windy locations.

If the goals of renewable energy policy are to create equal economic opportunity for all citizens, distribute renewable energy development geographically, and minimize costs to ratepayers, then wind tariffs must be differentiated by resource intensity. Often a further objective is to avoid a massive concentration of wind turbines in windy areas, as has occurred in California’s windy passes.

Both France and Germany have been successful in spreading development opportunity across their geographically diverse countries by means of differentiated wind tariffs. Farmers in the less windy interior of each country have the opportunity to develop their wind resource equal to that of farmers on the windy coasts. At the same time, both Germany and France have the ability – through differentiated tariffs – to limit overpayment to wind developers in windy areas, thus, reducing costs to ratepayers.

Germany and France differentiate tariffs by resource intensity for both onshore and offshore turbines.

- Resource differentiation for onshore and offshore wind: 10
- Resource differentiation for onshore wind: 8
- No resource differentiation: 0

### **Inflation indexing**

Most renewable energy technologies are long-lived and capital-intensive. As a consequence, the returns or profits from investments in renewable energy for two or more decades are significantly affected by inflation. Calculations basing tariffs on the cost of generation plus profit must either incorporate inflation in the initial tariff, or compensate for the erosive effect inflation has on profitability by adjustment of the tariff after the project has been built.

For the same level of profitability, initial tariffs must be higher when there is no inflation adjustment than initial tariffs in programs that index the tariff with inflation. Some programs have fully indexed the tariff with inflation. Others, such as Germany, have no inflation adjustment. France falls somewhere in between. Some French tariffs are indexed to 60 percent of inflation; others are indexed to 70 percent of inflation.

Clearly, Germany has been successful without adjusting for inflation within a contract. Yet Spain has also been successful with tariffs fully adjusted for inflation after a project is fully operable. Currently, the Spanish program provides inflation indexing of 75 percent under the fixed tariff track.

- Inflation indexing of > 50 %: 6
- Inflation indexing of 40–50 %: 5
- Inflation indexing of 30–40 %: 4
- Inflation indexing of 20–30 %: 3
- Inflation indexing of < 20 %: 2
- No inflation indexing: 0

## **Bonus points**

Current federal US policy provides an “incentive” of federal tax subsidies in the form of “tax credits.” Obviously, a generator can use these tax credits only if they have sufficient taxes due. Wind and solar PV in particular are extremely capital-intensive and most Americans of modest means do not pay enough in federal taxes to use all the credits that would accrue. On the other hand, large multi-national companies, and electric utilities have sufficient profits to use all the tax credits available. These tax credits are inequitable and unfair to the majority of Americans.

In the US, renewable programs designed to encourage equal participation across all economic classes will provide two tariff tracks: one that uses federal tax credits, another that does not. This is a situation unique to the US. As a result, bonus points are awarded for those US programs with two tracks, such as the one proposed in Indiana House Bill 1190.

- Dual tracks with and without federal subsidies: 5
- Single track: 0

## **Social adders**

Programs may also include payments, or “adders,” for various social objectives. Ontario, for example, wants to encourage local ownership of its renewable resources. While the Ontario feed-in tariff program is open to all, local residents and outsiders alike, the province wanted to promote as much local ownership as possible among community groups, cooperatives, and aboriginal communities.<sup>6</sup>

Ontario pays a premium of \$ 0.01 CAD/kWh for community-owned wind projects, and \$ 0.015 CAD/kWh for projects owned by aboriginal communities. Comparable “adders” are offered for other technologies as well.

- Community adder: 5

## The Gold Standard

Worldwide, the gold standard of feed-in tariff design is found in Germany, France, and Spain. These programs are at the top of the class.

Here is how these programs stack up against each other, using the grading system described. All three have similar programs. Both France and Spain have some modest project size caps and a little less granularity in some of their technology bands than does Germany. However, Germany has no inflation adjustment and Spain’s wind tariffs are undifferentiated. The tally?

The Gold Standard Report Card	France	Germany	Spain Fixed Payment
Program caps	10	10	10
Project size caps	8	10	8
Contract terms (years)	10	10	10
Technologies included: Wind, Solar PV, Hydro, Biogas, Biomass	10	10	10
Tariffs based on cost of generation	10	10	10
Tariffs differentiated by technology	10	10	10
Tariffs differentiated within each technology (granularity)	16	20	16
Tariffs differentiated by resource intensity for wind energy	10	10	0
Inflation indexing	6	0	6
Bonus points for programs with multiple tracks (US) or community power adders			
<b>Total</b>	<b>90</b> A	<b>90</b> A	<b>80</b> A-

France and Germany each have 90 points. They are both awarded an **A**. Spain’s total is 80 points and awarded an **A-**.

## Grading Scale

Programs with total points approaching those of Germany, France, and Spain are awarded an **A** or an **A-**.

Grading Scale Report Card	Grade	Points
	A	> 90
	A-	> 80 < 90
	B	> 70 < 80
	C	> 60 < 70
	D	> 45 < 60
	F	< 45

## Where We Have Been in North America

Before grading existing and proposed programs in Canada and the US, it is useful to see where we have been and, by extension, the progress we have made with more sophisticated programs.

Historical FITs Report Card	Score	Grade
Cal ISO4 (1983-1984)	43	F
Ontario SOC (2006-2008)	55	D

### California ISO4

The feed-in tariff that started the process that eventually resulted in the modern programs found in Germany, France, and Spain is California's Interim Standard Offer Contract Number Four (ISO4).<sup>7</sup> It was truly a "standard offer." It was a simple feed-in tariff, where only one price was offered. Contracts under the ISO4 were offered for 30 years, but the fixed-price portion was only offered during the first decade. Unfortunately, contracts were only available for a short period of time, from 1983 to 1984.

ISO4 was a resounding success and resulted in at least 1,200 MW of wind projects that have been generating more than one percent of the California's electricity for more than two decades.<sup>8</sup>

The fixed-price tariff under ISO4 contracts was based on the avoided cost of fossil-fired generation in the early 1980s, just after the Iranian revolution sent oil and natural gas prices skyrocketing. While the prices offered during the fixed-price period seemed high relative to the low fossil-fuel prices of the 1990s, they have been a bargain when considered over the entire period.

Based on modern programs, ISO4 was crude and benefited only large development projects and entrepreneurs, such as the wind farm developers in windy Tehachapi Pass.

By modern criteria, ISO4 would be awarded only 43 points – roughly half that of the points earned by programs in Germany, France, and Spain – and receive a failing grade of **F**.

### Ontario's SOC Program

In the spring of 2006, the province of Ontario launched its Standard Offer Contract (SOC) program. Though projects are still being installed under existing contracts, Ontario's SOC program stopped accepting applications for new projects in late 2007.

The SOC program was limited to projects of 10 MW or less. Though four technologies were included in the program, there were only two tariff tranches: one tariff for solar PV and another for all other technologies.

The tariffs were based on avoided cost, plus some adjustment for social and environmental values. As with programs elsewhere, based on similar criteria, the tariffs were insufficient to drive robust development. By mid 2009 only some 150 MW had been built.

The Ontario program was an honest first step, though it fell well short of successful European programs. By modern standards, the SOC program wins only 54 points and rates a solid **D**.

## Existing Programs

### Ontario's Feed-in Tariff Program

Ontario's Green Energy Act is the most progressive renewable energy policy in North America in more than three decades. The hallmark of the Green Energy Act is the Feed-in Tariff program.<sup>9</sup> Introduced in the fall of 2009, the groundbreaking program has awarded nearly 80 MW of contracts to homeowners for rooftop solar PV. In total, the program has awarded ~2,500 MW of contracts for wind, solar, biogas, and hydro projects. Almost one-fifth of these contracts have been won by homeowners, farmers, and community and aboriginal groups.

Ontario is at the top of the class not only in North America, but also in comparison to world leaders such as Germany, France, and Spain. According to the grading system described earlier, Ontario earns 85 points, putting it ahead of Spain and earning it a solid **A-**.

Existing FITs Report Card	Score	Grade
Ontario (2009)	84	A-
Vermont	54	D
Maine	43	F
Wisconsin IOUs	36	F
California	28	F
Oregon	16	F

The principal weakness of the Ontario Program is the absence of wind tariffs differentiated by resource intensity. Ontario's program does have tariffs for both onshore and offshore wind, but only one tariff for each tranche. Ontario's program also indexes tariffs inside a contract to only 20 percent of inflation, reflecting a mistaken view that inflation adjustment is only necessary to compensate for the variable costs of operation and maintenance.

### Vermont

Vermont makes the grade with a score of 54 points and, like Ontario's SOC program, earns a solid **D** for effort. While a credible first attempt at a system of feed-in tariffs, the Vermont program is far too timid. The Vermont program is limited to only 50 MW or approximately two percent of existing generation. Only two technologies have two tranches: biogas and wind. Biogas includes landfill gas and on-farm methane. Wind includes large and small turbines, a first in North America.

### Maine

Maine's program is even more timid and restrictive than Vermont's. Maine also limits its program to 50 MW, but this is less than one percent of generation. However, Maine has set aside one-fifth of its program for microgenerators. Maine also limits participation in the program to locally-owned projects. Altogether, Maine wins only 43 points, the same as that of the CallISO4 program of the early 1980s and thus earns the equivalent of an **F**.

## Wisconsin IOUs

“Voluntary” tariffs offered by Investor-Owned Utilities (IOUs) in Wisconsin are little better than those offered in Maine. Most striking are the paltry program caps in Wisconsin. Most of the IOUs with voluntary tariffs limit their programs to no more than a quarter of a percent of sales. Tariffs are based on avoided cost with some payment for value. As a result, the tariffs are insufficient to drive development. Tariffs differ slightly by technology but are not differentiated within a technology. Based on these criteria, Wisconsin’s voluntary tariffs bring up the rear with a tally of only 36 points, giving the programs a failing grade.

## California

California and Oregon are at the bottom of the class. California’s so-called feed-in tariff harkens back to the days of ISO4. A one-size-fits-all policy with a tariff based on the avoided cost, just as the famous ISO4 contracts. The approach taken by California 26 years ago was trendsetting then, but not so now.

Even the first German feed-in tariff program in 1991, the Stromeinspeisungsgesetz (StrEG) or the law on feeding-in electricity to the grid, was more modern than current California policy. Germany’s StrEG included at last two tariff bands and were based on the retail electricity rate, not the avoided cost or wholesale rate. Worse, California’s feed-in tariff program has

- a very low program cap,
- a low project size cap,
- tariffs that vary by time of day,
- tariffs based on avoided cost, and
- no differentiation.

While California’s existing policy is not the worst in the world, it is close. Only Oregon is worse.

## Oregon

Oregon’s so-called feed-in tariff legislation hardly qualifies for inclusion. Oregon’s program, if implemented, will include

- a very low program cap,
- a low project size cap,
- only solar PV, and
- a tariff based on avoided cost plus value.

At least Oregon provides a good example for policymakers across the continent of what not to do to create a fair, equitable, and robust feed-in tariff program.

## Proposed Legislation

Proposed FITs Report Card		Score	Grade
	Indiana HB 1190	82	A-
	California AB 1106	54	D

### Indiana HB 1190

House Bill 1190 was introduced into the Indiana General Assembly in January, 2010. HB 1190 is a comprehensive feed-in tariff bill patterned after Ontario's. However, HB 1190 goes beyond Ontario's feed-in tariff program and proposes differentiated wind energy tariffs based on resource intensity. It also proposes tariffs not only for onshore and offshore wind energy, but also for small wind turbines. Unlike Ontario, though, HB 1190 does not provide any adders for community-owned projects. Consequently, HB 1190 ranks high with a score of 82 – only slightly less than Ontario – earning it an A-.

### California AB 1106

In contrast to Indiana's HB 1190, California's Assembly Bill 1106 is a timid proposal with limited scope. AB 1106, as carried over from California's 2009 session, has an even lower program cap than the timid one in Vermont. The project size caps in AB 1106 are only slightly better (five MW) than Vermont's (two MW). AB 1106 will preferentially benefit solar PV and possibly some biogas projects, but will have little benefit for wind, geothermal, and concentrating solar. While tariffs will differ for each technology, the tariffs within each technology are limited to a size class greater than one MW. Tariffs for rooftop solar PV, for example, will have a size range from only one MW to five MW. There would be no specific tariffs for solar PV of less than one MW, even though generators of less than one MW qualify for the program.

AB 1106 might have been a progressive policy in North America five years ago, but it is not today. Time has moved on, and California, which has rested on the laurels it earned more than two decades ago from ISO4, risks being left behind as other North American jurisdictions race ahead.

## Programs Not Graded

Several programs have not been graded. Washington State's policy has not been included. Many analysts consider Washington State's program an innovative variation on net-metering policy, but not a system of feed-in tariffs where payment is made for all the electricity produced by a generator, which is called a "gross" feed-in tariff in Australia.

Municipal programs in Gainesville, Florida, San Antonio, Texas, and Sacramento, California have also not been included. Not all renewable energy technologies may be applicable to the limited geographic area of a municipality, so it is unfair to compare municipal programs to state and provincial programs.

## Grading Tables

The tables used to grade each program can be found online at:

- [http://www.wind-works.org/FeedLaws/USA/Feed-in Tariff Grade North America 2009.qpw](http://www.wind-works.org/FeedLaws/USA/Feed-in%20Tariff%20Grade%20North%20America%202009.qpw)
- [http://www.wind-works.org/FeedLaws/USA/Feed-in Tariff Grade North America 2009.xls](http://www.wind-works.org/FeedLaws/USA/Feed-in%20Tariff%20Grade%20North%20America%202009.xls)

## Notes

- 1 Feed-in tariffs are also known as feed laws, feed-in laws, renewable energy payments, Standard Offer Contracts, and Advanced Renewable Tariffs. Note that the term Standard Offer Contract (SOC) is sometimes used interchangeably with feed-in tariff, but only the simplest feed-in tariff is equivalent to a SOC. Modern feed-in tariffs require standard contracts, but the “offers,” or tariffs are anything but “standard.” See **Evolution of Feed-in Tariffs** by Paul Gipe, 2009 for further details.
- 2 See **Model Advanced Renewable Tariff Legislation**, and **Powering the Green Economy: The Feed-in Tariff Handbook** by Miguel Mendonça, David Jacobs, and Benjamin Sovacool, Earthscan: London, 2010, ISBN: 978-1-84407-858-5. The National Renewable Energy Laboratory is publishing a best-practice paper in 2010.
- 3 Installed wind capacity in France at the end of 2008 was 3,400 MW, well behind Germany at 24,000 MW and Spain at ~17,000 MW.
- 4 Spain has two programs, one with fixed tariffs, and another with a premium payment on top of the wholesale price. Only the program with fixed tariffs is considered here.
- 5 In California “avoided cost” is called “market-price referent.”
- 6 Aboriginal communities include both First Nations and Métis.
- 7 It was called “interim” because it was considered temporary until further hearings before the Public Utility Commission established the “final” program. Though a FSO4 was proposed, it was never implemented.
- 8 ISO4 contracts also resulted in ~600 million kWh per year of generation from concentrating solar plants in the Mojave Desert. These plants have been online for more than two decades.
- 9 Not since 1978’s National Energy Act in the US has any one program as comprehensively addressed energy issues as has Ontario’s Green Energy Act.