California Energy Commission
2011 Integrated Energy Policy Report
Re: Docket No. 11-IEP-1G

Clean Coalition comments on Renewable, Localized Generation CEC Workshop May 9th 2011

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The Clean Coalition (formerly The FIT Coalition) is a California-based advocacy group focused on timely and cost-effective renewable energy policy, particularly in relation to feed-in tariffs and "wholesale distributed generation" (WDG), which is generation that connects to distribution lines close to demand centers. Our members are active in proceedings at the Public Utilities Commission, Air Resources Board, Energy Commission, California ISO, the California Legislature, Congress, the Federal Energy Regulatory Commission, and in various local governments. It is well recognized that we need sustainable, reliable and affordable energy supplies. Competition for non-renewable fuels is already and will increasingly reduce the predictability of supply and price, increasing economic risk. We applaud the Energy Commission for supporting the European Distributed Generation Infrastructure Study and subsequent workshop, and appreciate the opportunity to offer these comments in response to the questions posed by staff.

CEC Staff requested comment questions:

1). *Please suggest a methodology for setting interim and regional targets building to the 12,000 MW goal by 2020*

Targets should apply to all load serving entities while allowing flexibility in approaches and balance in application.

There is no technical basis for discriminating between residential, commercial or public sectors. Likewise, grid impact is determined by actual energy flow, not by the billing or metering distinctions of wholesale or net metered generation.

It is appropriate to prioritize best use of the distribution system, but this may be well determined by distribution system operators with guidance from the Commission.

Since distributed generation is particularly suited to serving local demand, targets should be weighted toward distribution network peaks rather than statewide coincident peak.

Consideration of local resource potential should be included in setting targets, but should not be deterministically applied. We recommend inclusion of resource potential at perhaps 50% weighting relative to local peak load, ensuring balance and flexibility. In the most simple application, utility A with only half the equal cost adjusted resource potential of utility B would be responsible for a roughly 25% lower target in recognition of this difference.

2). *Could a 15 percent of peak load or 50 to 100 percent of minimum load penetration rate be implemented statewide? If so, how much renewable capacity would be installed per utility?*

The 15% penetration screen was set as a conservative benchmark more than a decade ago. While there are exceptions for a small percentage of distribution lines, the vast majority can accommodate DG penetrations of at least 15% with minimal changes. Experience in the intervening years both in California and in Europe (as delineated in the KEMA study) indicate that greater penetrations are relatively easily accommodated on systems operated with modern equipment.

It is worth noting that California has over 8,000 distribution circuits, typically with a 10MW load, and if each circuit carried only 15% DG, the 12,000 MW target would be reached. However, limiting each circuit to 15% inhibits cost effective use of the full potential of the grid, including the development of generation systems larger than 1.5MW, and greater penetration should be accommodated on most lines as load profile data and equipment modernization allow.

Some utilities have noted that European distribution systems run three-phase lines, allowing greater voltage balancing than is available on single or double phase lines found in California. While this can be a factor, it is in fact common practice in California to utilize a three-phase configuration on the DG main trunk lines leaving distribution substations, and only switch to a single-phase or double-phase configuration for many smaller downstream branches. Larger WDG installations already want to connect to the main trunk lines when possible to take advantage the larger available line load and resulting capacity. Even under circumstances in which significant load imbalances exist between phases, options such as transferring customer loads between phases can typically be employed. We note that KEMA concluded that this often cited difference in distribution design between California and the EU should have a negligible effect on DG integration[1], and the same holds true for differences in grounding standards.

With Germany's concentration of PV on DG lines in limited areas in the southern regions of the country, peak generation on 30% of rural lines exceeds 100% and sometimes even 200% of load; planning for this, local operators manage these penetration levels successfully. In California, SMUD has accepted penetration levels at 100% of load on a limited number of lines without grid particular difficulty. After some initial hesitation over backfeed, Portland General Electric also found it to be easily managed on individual lines.

Modernization of substations to accommodate bi-directional flow both between feeder lines and on to higher voltage should be rapidly accomplished as needed to encourage generation where most beneficial, and to allow generation where available.

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[1] KEMA (2011), Distributed Generation in Europe – Physical Infrastructure and Distributed Generation Connection, p 48.

3). *Please provide comments on any methodologies discussed at the workshop.*

Centralized monitoring and control of both generation and load throughout the grid is essential for improved grid operation, reliability, energy quality, and efficient use of resources. Demand Response and Generation Curtailment are readily available simple and extremely cost effective initial applications. Increasing sophisticated detailed grid monitoring and control should be immediately pursued, planned for, and actively implemented in order to achieve capabilities that will be required beyond 2020; however, these are not necessary to meet the State's interim goals and are not a legitimate basis for delay, in fact Demand Response capability is rarely employed in the German and Spanish examples.

4 & 5). *Should the state create incentives or penalties to ensure achievement of targets?*

Targets have no significance if there is no incentive for those responsible for achieving them to do so. Even when the long term advantages are clear, short term considerations are often given priority. It is the purpose of the Commission to provide planning to meet the long term interests of the State, and to ensure that those goals are realized. If the systems and infrastructure are not designed to accommodate future needs, those needs will not be met.

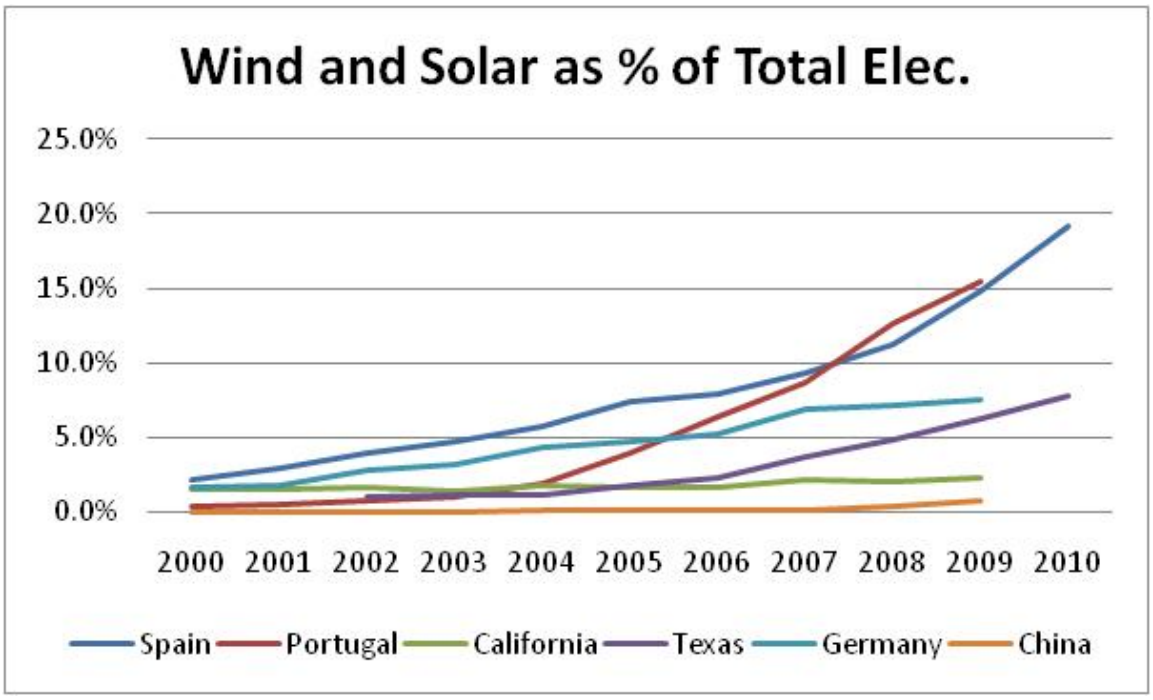
As market incentives have long proven effective and efficient, consideration should be given to a Cap and Trade minimum implementation schedule. This will encourage the most widely distributed adoption of cost effective optimization of existing grid and energy resources.

6) *What are the near-term and long-term actions needed to achieve 12,000 MW by 2020?*

As with any market, establishing the supply and delivery of generation to meet the State's goals requires establishing when and where the demand exists and the physical ability to get the supply to that market. In the case of DG, this means procurement and grid interconnection, both of which are severely impaired in California.

As a result, despite a head start, California is falling behind, with New Jersey having already matched California's per capita PV capacity in the course of a few years, and all nine of the other top ten solar states growing at much faster rates. The international comparisons are even more striking, showing California virtually standing still over the last decade compared to other states and nations, as shown in the following chart produced by the Clean Coalition:

Comparing California with other jurisdictions (2000 - 2010)



Source: EIA, CEC. California totals include IOUs and POUs.

Without mandates, incentives or consequences, California's major utilities have not been proactive in planning and facilitating DG interconnection beyond the modest net metering CSI program. In recent years the growth in wholesale DG projects seeking connection to the grid, despite still numbering only in the hundreds, has faced year long backlogs in approval. IOUs have only recently added staff to these small departments, and the interconnection approval process remains lengthly, highly unpredictable, and frequently costly.

When a supplier cannot determine when he can deliver his product to market or how much it will cost to do so, business is discouraged, few suppliers participate, and prices remain high.

Germany in particular provides simplicity, transparency, certainty and longterm predictability in both its interconnection and procurement pricing systems, and the markets have responded with ample and increasingly affordable supply.

While the rate per kWh paid for solar energy under Germany's hugely successful Feed-In Tariff WDG program is not cheap, this is an unsubsidized full market price in a region with solar resources (and output per panel) equivalent to Alaska. By comparison, the average cost of PV generation paid in Germany last year, if adjust for California's solar availability and the financial support of US tax credits and depreciation allowances, was about 12¢/kWh, and falling. With improved procurement and interconnection practices,

WDG businesses in California can readily provide the State with similar economies of scale and progress in attaining deployment goals.

Implementation and expansion of CLEAN/FIT programs such as SB32, and full consideration of avoided costs (over the lifetime of the contract), both to the serving utility and direct and indirect impacts to the State is essential. These have been well established for California in *Economic Benefits of a Comprehensive Feed-In Tariff*[2]

Superior implementation of even limited "smart grid" systems in both Spain and Germany provide far superior levels of visibility and control to grid operators. This level of monitoring and control would support higher penetration levels, but is not essential for achieving the State's DG goals. Grid operators should plan for foreseeable opportunities and benefits and implement grid data collection and control capacity as part of modernization. There is nothing preventing our utilities from adopting simple and effective systems already implemented elsewhere. This is not a reason to further delay DG growth in the interim, and implementation should be designed to avoid burdening generators with prohibitive and unnecessary costs. It should be noted that relatively few systems in Germany actually have realtime telemetry installed, and that management is primarily accomplished with low cost communication and effective modeling based on limited data.

Software tools used by grid operators for DG interconnection planning in Germany and Spain are comparable to those used in California, and some of the same vendor's load-flow tools are employed. However, the German grid codes also provide simplified r*ule-of-thumb* formulas that estimate the technical performance levels of any proposed DG project and point of common coupling. Applying similar rule-of-thumb formulas may be useful in California and could be the basis for improved penetration level screens and interconnection cost estimation. This would result in more timely handling of interconnection applications and more predictable costs. While there is debate over assignment of financial responsibility for interconnection in California, establishing a standardized table of assigned costs based on average costs per project category should be considered as a means of increasing predictability of market entry costs. Uncertainty under California's current system discourages participation, and delays processes - SCE reported in testimony that "Most issues are cost related, not physical. Due to costs and negotiations, projects often go back for restudy 2-3 times, contributing to bottlenecks in the queue and study process." The establishment of predefined standardized interconnection costs would avoid these issues, providing transparency and predictability to the process while greatly reducing study requests for projects that will not be built.

As argued by numerous parties in the Long Term Planning and Procurement Renewable Integration Modeling proceedings, forecasting accuracy can and is becoming vastly

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[2] Wei, M., Kammen, D. (2010) Economic Benefits of a Comprehensive Feed-In Tariff: An Analysis of the REESA in California. Renewable and Appropriate Energy Laboratory Energy and Resources Group, University of California, Berkeley.

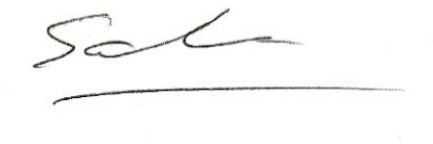
improved, and such improvement should be expected to proceed. The CEC's support for research in this area has been valuable, and experience gained from practices in Europe and other balancing authorities can be readily incorporated. Improvements in forecasting accuracy have steadily outpaced the rate of DG growth in California and this should not pose a barrier to the State's goals.

In summary, the KEMA report commissioned by the CEC supports in detail the assertions made by WDG advocates that the successful European experience of distributed generation, deployed at a scale and pace an order of magnitude greater than we have been achieving, is replicable in California. The barriers are not based in any fundamental technical differences or excessive payments, but in implementation policy.

The key clearly lies in the establishment of a functioning market, in which the value of generated energy and the cost and ability to deliver it to market is known. CLEAN type programs involving standard offer WDG power purchase agreements, with pre-established pricing and predictable, transparent, and timely responses to interconnection requests, are responsible for the majority of the renewable energy deployed world wide in recent years.

Respectfully submitted,

K. S. White



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