Comments on China's "Second Consultation Draft of Renewable Energy Power Quotas and Assessment Methods"

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We appreciate the opportunity to comment on the recently released "Second Consultation Draft" of a renewable energy quota policy in China. Our views on the proposal expressed here are preliminary—based on our current understanding of the proposal, our longstanding experience with renewable portfolio standards (RPS) and quota policies internationally, and our ongoing engagement in China on renewable energy policy design and power market reform. Some of our comments are consistent with comments provided on the previous consultation draft, whereas others are new.

To very briefly summarize our major comments, which we elaborate below, we start by acknowledging the many significant advancements to this draft quota design in comparison to a previous draft that we reviewed in April 2018. Nonetheless, we have a number of suggestions for increased emphasis, clarification, or policy improvements for your consideration. Specifically, we encourage greater consideration be given to several core areas of the design:

(1) Yearly quota implementation and possible value of additional flexibility and longer-term targets;
(2) Green certificate price transparency, and the possible value of centrally administered auctions;
(3) Clarification on the allocation of green certificates associated with feed-in-tariffs (FiT) and auction mechanisms;
(4) Reducing the risk for purchasers from possible curtailment;
(5) Challenges associated with provincial implementation, and value of central government guidance on quota design and, over time, multi-provincial green certificate markets;
(6) Clarifications and rules associated with green certificates from distributed generation and inter-provincial trade of renewable energy;
(7) Potentially a single, national and lower-priced quota compensation standard to, in part, reduce unnecessary complexity; and
(8) Clarifications on the relationships between voluntary green power market and the quota.

We understand that the proposed renewable quota in China has a more complex set of objectives and constraints than RPS policies implemented elsewhere: namely, that the primary goal in the near term is to increase the consumption of renewable energy by reducing curtailment. And then, over time, the quota should begin to compensate for any "above-market" costs of renewable energy through market mechanisms that do not require the Chinese government to collect and disperse revenue as with the current renewable energy fund. The FiT and, more recently, auction mechanics are being used to support growth in renewable energy, so the quota policy need not serve that purpose alone. At the same time, it is clear that the quota will need to interact effectively with emerging power markets, and with existing and possible new means of supporting the financial viability of renewable energy in those markets. **This remains a very complicated set of requirements, making the design and implementation of a quota in China especially challenging.** As such, there is no "ideal" design for a quota in China, and any proposal will have advantages and disadvantages, and embed various tradeoffs. We applaud your efforts to work through these complexities so far.

Our initial comments are provided below, based on our present understanding of the proposal. As always, we would be happy to discuss these with relevant actors in China and stand ready to assist in this difficult endeavor in the weeks and months ahead. Please do not hesitate to reach out.

To start, it is useful to describe the positive aspects of the proposal. Some of these positive aspects carry over from the previous consultation draft. Moreover, a number of changes have been made to the earlier draft proposal, and we view most of these positively. We appreciate the significant efforts made to listen to stakeholders and other interested partings and reformulate the proposal in positive ways.

The strengths of the current draft include:

- Relative to the earlier draft, the current version places more weight on central and provincial government actors for quota establishment, implementation, oversight, compliance verification, and enforcement. To be sure, the provincial grid companies maintain a very significant role, but the current draft more strongly recognizes that entities that have compliance obligations cannot also be regulating the compliance obligations of others. We very much applaud these revisions, especially the important role of provincial actors, enforced in part via the "double control" assessment—these are strong provisions, if enforced actively at the central government level.
- The obligation applies to "retailers" (those that sell power to end-use customers) and includes direct sales and self-consumption (for industrial firms with captive coal, for example). This matches international experience, and it is especially important to include end-use self-consumption.
- The proposal addresses how the quota will interact with the FiT and emerging auction mechanisms, with projects receiving FiT or auction revenue not allowed to sell green certificates. Instead, green certificates from these projects (based on metered generation) will transfer to the buyer (or, for generation above the minimum generation hours, green certificates can be sold, but any subsidy will be reduced according to the green certificate

revenue). That is a good principal, and the authors are usefully thinking about policy interactions. Addressing the intersection of the quota with the FiT, auctions, power market reform, transmission and distribution (T&D) price reform, retail price regulation, carbon markets, voluntary markets, and other policies is essential.

- Related to this, the current draft better clarifies the process of allocating green certificates associated with the FiT and auctions: these green certificates are not to be re-sold by the provincial grid companies, but instead are first allocated to meet the quotas for residents and public utilities and services, and then if more remain, to other "power purchase users who participate in direct power transactions, independent power sales companies, and enterprises with captive power plants." We have comments on this approach below, but in general, we find it to be appropriate, as the power grid companies should not be allowed to profit from selling green certificates that have been transferred to them "for free" via FiTs and auctions, especially given the grid companies' dominant position in the market.
- Separating the target for non-hydro renewable energy from the one with hydropower makes sense in China, given the distinctly different dynamics for hydropower than for other forms of renewable energy. This approach also generally matches international and U.S. experience.
- We find generally appropriate (with more detailed comments below) the approach to non-compliance enforcement and penalties, with a "quota compensation," to-be-specified penalties for parties that fail to comply even based on that "quota compensation" amount, and separate consequences for provinces that fail to effectively implement quota mechanisms. These mechanisms are much clearer than in the earlier draft proposal, with appropriate responsibility vested in government bodies as opposed to the grid companies.

There are a number of challenges in implementing a quota in China, given other overlapping policies and ongoing power market reform. Below is a list of the more important challenges in our view, as they relate to our understanding of the current quota design proposal.

Purpose and Objectives: A core motivation for the quota in China is to increase the use and consumption of renewable energy—and the need to manage grid integration and reduce curtailment should of course be a top priority. The quota, as proposed, may help change the current dynamics that increase curtailment, and so may be a useful supplemental mechanism to help ensure consumption of renewable energy. This is especially the case under the current design, as provincial authorities and organization have important roles to play in implementing the quota, and in facilitating renewable energy consumption. In particular, the quota as designed may encourage the provincial governments to actively address curtailment and may counter the provincial motivations to otherwise support in-province generation and coal. The quota may also offer a supplemental motivation to the grid companies and dispatchers to do what they can to lower curtailment amounts. That said, the quota alone cannot realistically resolve these challenges fully, so we encourage continued emphasis on other critical tools to reduce inefficient renewable energy curtailment. The quota alone cannot be expected to resolve all issues around efficient utilization of renewable generation facilities. Addressing issues around economic utilization will ultimately require integrating renewable generation into market operations and ensuring compatibility between the quota system and emerging

wholesale markets. Among the most critical additional areas of focus in reducing curtailment are therefore economic dispatch, continued opening up of annual generation output planning, reformed generator compensation, larger markets and transmission usage, and enhanced generation and load flexibility.

Yearly Quota Implementation: Unlike RPS policies elsewhere, the draft design envisions a yearly process. Quotas are established each and every year, during the year. Green certificates are valid for only that single year. Compliance enforcement and any related penalties are applied after the year. And then this process is repeated, each year.

We understand that this approach maximizes flexibility, which is useful with a market that is growing and changing as rapidly as that in China. Additionally, with the FiT and auctions for renewable energy, the quota is not alone in offering longer-term revenue certainty to renewable energy projects. However, we also see three challenges to this approach that ought to be considered:

- Complexity: With a large number of provinces and a large number of involved parties in quota design, oversight, implementation, and enforcement, administering this entire process on an annual basis will be extremely challenging.
- Resource Variability and Related Price Volatility: Hydropower generation varies substantially from one year to the next solely based on weather patterns. The same is true, to a lesser extent, for wind. With one-year obligations and one-year green certificate validity many provinces and compliance parties will be unable to meet their obligations during dry (or low wind) years. This is especially the case if green certificate markets are largely provincial in nature, and not national in scope, due to greater inter-year variations in hydro output at the provincial level. This will trigger the force majeure provisions established in the draft in Article 29 ("abnormal state of renewable energy resources caused by natural causes") very regularly, requiring considerable oversight complexity. It would also be expected to yield extreme green certificate price volatility if the policy is ambitious. In the U.S., we have many state RPS markets that have experienced sizable variability in renewable energy credit (REC) prices.
- Market Stability and Long-Term Contracts: One common goal for RPS policies internationally is to try to reduce the cost of renewable energy deployment, through market competition. International experience with the achievement of this goal is very clear, finding universally that AUCTIONS for LONG-TERM CONTRACTS are the best means of reducing the cost of renewable energy deployment. Short-term trade in green certificates has been found to be a useful supplemental balancing mechanism for compliance, but wherever it has been the primary means of compliance (UK, New England in U.S.), experience has shown that either the RPS is met at high cost, or not met at all. In China, the role and need for long-term contracts may not be as pressing in the near term given the parallel FiTs and auctions. However, if over time the quota intends to coordinate with power market reform, and there is a transition away from the FiT and auctions, then, to be successful, the quota may need to transition towards supporting long-term contracting between renewable energy projects and purchasers of

green certificates and renewable energy. Moreover, even without long-term contracts per se, having longer term quota targets—even if provisional—will provide stakeholders additional clarity and certainty on the demand for green certificates in future years.

We do not recommend specific design changes, but we encourage further thought about these concerns. One option would be to enable green certificates to have two to three years of validity, to help ease concerns about year-to-year resource variability especially for hydropower. This would be expected to reduce what might otherwise be extreme volatility in green certificate pricing and the regular triggering of the *force majeure* provisions. Another option is to allow banking of green certificates for quota compliance. Excluding hydropower from the quota would be another approach; hydropower is rarely included in RPS policies internationally, in part due to this concern. Finally, multi-year targets could be established, rather than revising targets every year, which may also reduce oversight complexity.

Overall, these concerns are significant, and we encourage additional thought along these lines to reduce green certificate price volatility and facilitate compliance.

To address the market stability and longer-term contracting concerns, clarity on the long-term renewable energy obligations is very important, even if those targets are provisional. As such, establishing provisional provincial targets a decade or more ahead of schedule might be considered. One approach might be to establish a transparent process for determining reasonable (and reasonably ambitious) provincial quotas linked (at least at first) to improved five-year planning and to ongoing implementation of the National Energy Administration's 'comprehensive power sector planning' rules. While long-term targets could be adjusted over time, establishing such targets would provide market players more certainty and may help encourage a greater degree of long-term planning and contracting for green certificates and renewable energy. It may not be essential to address this concern immediately. However, as indicated earlier, if over time the quota intends to coordinate with power market reform, and there is a transition away from the FiT and auctions, then to be successful the quota will need to transition towards supporting long-term contracting, and long-term targets may be necessary in that instance.

Centrally-Administered Auctions for Green Certificates: Short-term green certificate prices tend to be very volatile and uncertain, and financiers have a hard time providing low-cost finance in that circumstance. Additionally, in the case of China's quota, the buying power of the provincial grid companies may make green certificate price discovery challenging for smaller players. Specifically, the provincial grid companies, given their size, may have ready access to lower-cost green certificates, with smaller market participants not having easy access to low-cost green certificates for quota compliance. Concentration in ownership of renewable energy facilities may also reduce competitive pressures and create pricing anomalies.

One approach that might be considered to help ensure price discovery and equal market access to lower-cost green certificates would be to conduct regular auctions for green certificates. The power market trading centers might be appropriate entities to administer such auctions or, alternatively, a governmental agency could conduct the auctions. While the precise design of such auctions would need to be considered at greater length, we recommend additional

thought along these lines. One option would be to make such auctions mandatory, similar to the approach taken in New York. There, a state agency procures RECs through auctions, and then distributes those RECs to RPS-obligated parties, in proportion to the obligated parties' shares of total retail electricity sales. The RPS-obligated parties are required to pay the state agency for the RECs that they have been allocated. Another approach would be to make such auctions voluntary, and just one of many means of procuring green certificates.

Article 26 Allocation of Green Certificates from FiTs and Auctions: We appreciate this article, and generally agree with the approach taken in as much as we understand the intent, as noted earlier. However, there is at least one aspect of this article that remains unclear to us. Specifically, the non-purchased green certificates are allocated to complete the effective quotas for residential customers, and for important public utilities and public services. That much makes sense. However, if additional non-purchased green certificates are left over, then those green certificates are to transfer to "power purchase users who participate in direct power transactions, independent power sales companies, and enterprises with captive power plants."

What is unclear to us is how those transfers are to take place. First, we presume that the transfers will occur at no cost—that is, the provincial grid companies that have access to these green certificates will not be allowed to profit on the sale of these green certificates, but instead they will be transferred for free. This is not entirely clear, but we agree that such green certificates should transfer for free. Second, it remains unclear how the provincial grid companies will choose WHO and in WHAT PROPORTION these green certificates will transfer to. Perhaps this will be established in the annual quota implementation plans submitted by the provincial energy authorities. That approach is workable, but we encourage NEA to establish clear standards or rules around these "for free" transfers.

In particular, it seems to us that these non-purchased green certificates should: (1) transfer for free, and (2) should be transferred proportionally to all parties obligated to meet the quota to ensure that these transfers do not differentially and inappropriately benefit certain market participants. We encourage additional text providing guidance along these lines.

Risk of Curtailment for Green Certificate Purchasers: One of the key objectives of the policy is to encourage renewable energy consumption and reduce curtailment. And yet, curtailment remains a risk for parties obligated to meet the quota in as much as curtailment will impact the amount of green certificates available, and therefore whether the supply of green certificates is sufficient to meet quota obligations. Many of the obligated parties under the quota are not responsible for dispatch decisions, and so have little recourse in cases that curtailment is high. A power retailer, for example, might sign a contract with a generator for 500,000 MWh of green certificates, but if the generator is curtailed and is only able to deliver 300,000 MWh of green certificates, the power retailer may fail to meet its quota obligation. This is a common problem in other jurisdictions as well, but curtailment volumes are much lower elsewhere, so this issue has not been a major concern. In China, however, any renewable generation above the "guaranteed purchase" levels may be especially prone to curtailment, imposing a risk on those purchasing green certificates on the market to meet their quota obligation.

There is no obvious way to eliminate this risk, but three partial solutions might be considered. First, a lower "quota compensation standard" price might be appropriate, in part so as not to unduly penalize obligated parties that are unable to meet their quotas due to curtailment that is out of their control. We address this point further below, and recommend consideration of a single, national quota compensation standard established at a lower price level than envisioned in the consultation draft. Second, some of the flexibility mechanisms mentioned earlier (multi-year compliance, multi-year green certificate eligibility, and banking of green certificates for compliance) can help reduce the impacts of curtailment risk on overall compliance. Third, NEA and the provincial authorities could require the grid companies to dispatch renewable energy using a penalty price based on replacement costs or the quota compensation standard. This would place strong priority on dispatching renewable energy, because it, in effect, ensures that the marginal cost of renewable energy is negative in dispatch decisions. Under such circumstances, a zero-marginal-cost renewable generator would be bid into the market at a negative price equivalent to, for example, the quota compensation standard level. This would enable wholesale prices to go negative and would therefore provide a strong economic signal to reduce the dispatch of other generators before curtailing renewable energy. As economic dispatch is introduced in China, this would help prioritize dispatch of renewable energy over other, more costly supply sources, and would provide economic signals to increase the flexibility of other forms of supply, load, and storage.

Devolving Quota Implementation to the Provinces, with Many Parties Involved: The quota design establishes a framework and then requires provinces to come up with the implementation details. We fully understand the rationale for this approach, but it could lead to a very wide range of implementation strategies, inconsistencies between provinces, and a lot of complexity. Inasmuch as possible, the central government should provide detailed design guidance and assistance to provinces, to support common implementation strategies to reduce unnecessary differences between provinces and the increased complexity that results from it. Over time, we believe it will be beneficial to harmonize key aspects of provincial implementation rules to enable this larger green certificate market and lower-cost regional development of renewable energy. In fact, over time, we would very much encourage multi-province quota systems as opposed to systems that vary across every province: larger markets for renewable energy and green certificates will generally yield lower costs of achieving the quotas. Admittedly, such an end-state would likely require careful design, and strong central government leadership.

Distributed Generation and Green Certificates: As we read the consultation draft, "renewable energy that is generated and consumed by end users in the operating area" will be counted towards the quota calculation of each power grid company. We infer that the green certificates from customer-sited PV generation will automatically transfer to the power grid companies. However, separately, the proposal indicates that quotas for category 4-6 entities will include self-generated renewable energy power. Later on, in Article 22, it indicates that individual investors in distributed renewable projects are to be registered and then managed collectively at the county or city level.

We are somewhat confused about how the consultation draft treats distributed forms of renewable energy, especially distributed PV generation: Who gets the green certificates—the grid companies, or the entity that those projects serve? Can those green certificates be sold, or do they transfer automatically? Can customers retain these green certificates to make "green" claims? Greater clarity along these lines is needed. These issues have also been hot topics of discussion internationally, and we would be happy to discuss them further.

Inter-Provincial Trade: Tracing green certificate transactions across provincial boundaries will be very challenging, especially in the case of meshed AC grids (point-to-point DC lines are far easier to deal with) and if provincial power markets are not well linked with one another. These challenges have been addressed internationally, but not with ease and never perfectly. Divergent provincial power markets and quota designs in China will multiply the challenges enormously.

It will therefore be very important that detailed, central-government guidance is provided to provincial parties on how to track such inter-provincial trade. That detailed guidance should be offered soon, as it is critical that a common approach is used across provinces, rather than allowing each province to establish different rules in this regard. We believe this is a critical feature of quota design and has often been found to be very challenging in practice; it may be especially difficult in China. As such, we recommend immediate and focused attention to these challenges, and that clear and standardized guidance be given to provincial authorities so that a standardized solution is developed.

Quota Compensation Standard and Enforcement: The proposal establishes a form of "alternative compliance payment," called the "quota compensation standard." We support this approach to financial compliance. It is very commonly used in the U.S. We also appreciate that, unlike in the first draft of the quota design, this version provides some clarity on WHO will establish the quota compensation standard (NEA), and also the level of the quota compensation standard (sum of on-grid coal tariff, highest distribution price, government funds, surcharges, and cross-subsidies).

We do wonder whether establishing this alternative compliance payment level based on, in effect, the retail price of electricity, is the best approach. Internationally, these "alternative compliance payment" levels are typically much lower, intending to reflect the maximum incremental cost of renewable energy that policymakers deem appropriate. Often times they are around 4-5 U.S. cents per kWh. We wonder whether it might be appropriate and less complicated to simply establish a single, national "alternative compliance payment" amount of ~4 U.S. cents/kWh. This should be sufficient to motivate green certificate purchases and minimize regulatory burdens of establishing different levels for each province, each year. It would also not unduly penalize those unable to meet the quota obligation due to curtailment and ensure that the grid companies do not have an incentive to curtail renewable energy.

Voluntary Green Power Market: As has been shown internationally, the voluntary market for renewable energy and green certificates can usefully supplement government policy support. Corporate demand for renewable energy has grown especially rapidly in recent years, on a global basis, and there is burgeoning demand in China. It is important that voluntary green

power demand be allowed, while at the same time ensuring that the market is populated with credible and reasonably priced green power products.

We recommend including text in the quota design on the voluntary market, to clarify appropriate interactions with the quota. Including some text in the quota design on the intersections between the two markets could offer useful clarity to market participants in both markets.

Specifically, the draft might establish the principal that customers are allowed to pursue direct renewable energy purchase (or self-generation) and green certificate transactions above and beyond the quota, thereby fostering the voluntary markets. Additionally, the draft might establish that the green certificates for those transactions are to be retired, and that the same renewable energy (or certificate) must not also be used to meet quota obligations so as to ensure "additionality" (that is, that voluntary purchases increase renewable energy generation above the level of the quota). Third, and consistent with current policy in China, it is important that any green certificates associated with projects that are receiving full revenue through the FiT or auctions not be used to serve voluntary markets, as these transactions are not truly "additional." Finally, we understand that the tracking systems to be used for the quota may be different from and additional to the one used for voluntary markets. We encourage a move towards a "merged" single tracking system, even if different requirements must be met for the voluntary market in comparison to the quota market. A single merged tracking system can still allow distinct requirements for each market, will result in less complexity, and is a common international practice.

We would be happy to engage in further conversations on these topics; but, for now, we want to emphasize that clarifying the relationship between the quota, the voluntary market, and the FiT/auctions will facilitate longer-term renewable energy growth in China.

About the Authoring Organizations

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CRS is a national nonprofit with global impact. It develops expert responses to climate change issues with the speed and effectiveness necessary to provide real-time solutions. Its leadership through collaboration and environmental innovation builds policies and consumer-protection mechanisms in renewable energy, greenhouse gas reductions, and energy efficiency that foster healthy and sustained growth in national and international markets.

Energy Foundation Beijing Representative Office

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We support policy research, the development of new standards, capacity building, and dissemination of best practices across seven programs: clean power, environmental management, industry, low carbon economic growth, low carbon cities, transportation, and strategic communications, with a view to assisting China in coping with energy challenges.

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