Background Notes for TUED Working Paper #10:

Preparing a Public Pathway:
Confronting the Investment Crisis in Renewable Energy

Following is additional material that illustrates and contextualizes sections of the published paper. Page numbers refer to the page in the published paper to which the quotes and diagrams are relevant; headings and sub-heads are included only where they may help identify the section of the paper to which quotations pertain.

The full paper is available for download at: http://unionsforenergydemocracy.org/resources/tued-publications/tued-working-paper-10/

Introduction (p. 1)

Our policy agenda must ultimately be effective in mobilizing clean energy investments by private business owners. There is no other way.

— Center for American Progress, September 2014¹

The private sector invests trillions of dollars into energy and other infrastructure projects, but in most cases the goal of reducing GHG emissions does not guide such spending.

— Prince of Wales Corporate Leaders Group, 2015²

Market-based, unsubsidised low-carbon investments have been negligible.

— International Energy Agency, 2016³

Part One: Investment Deficit Realities (p. 6)

Keeping temperature increase below 2°C will require revolutionary changes [to the energy system].

— Maria van der Hoeven, then Executive Director, IEA, 29 September 2014⁴

¹ Center for American Progress, Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities, Sept 2014 (Robert Pollin, Heidi Garrett-Peltier, James Heintz, and Bracken Hendricks)
**Figure 1.1: Global energy investment (p. 8)**

(Source: IEA, World Energy Investment 2016)

**Figure 1.2: Global electricity production and technology shares in the IEA “2 Degrees Scenario” (“2DS”) (p. 8)**

(Source: IEA, Energy Technology Perspectives 2016)

**Figure 1.3: Growth in investment needs in low-carbon power generation and energy efficiency (p. 9)**

(Source: IEA, World Energy Investment Outlook 2014)
Part Three: The “Out-of-Market” Experience (p. 17)

Right now, we are careering down a path to more and more regulatory interventions. We are not talking about a broad national energy and resource plan: we are talking about demands for a particular mix of supply, particular technologies to keep the grid stable, particular new technologies to be piloted, particular levels of interconnection, particular programs of investment in energy efficiency and particular consumer prices – with guaranteed returns as rewards for compliance and the cost of mistakes borne by users. It might be easier to just nationalise the whole network outright.

—Michael Liebreich, Bloomberg New Energy Finance, May 2017

Figure 3.1: EU progress towards 2020 climate and energy targets (p. 18)

(Source: European Environment Agency, Trends and Projections in Europe 2016)

Figure 3.2: Evolution of the share of renewable power levies in electricity price for households in selected EU countries, 2009-12 (p. 19)


Part Four: Slow Motion Calamity? How “Market Design” Has Created a Risky Future (p. 29)

Battleground Economics: Wholesale and Retail (p. 30)

The crux is that competition in most power markets is determined by short-run marginal cost: how cheaply you can run your power plant in the next hour, compared to your competitors.5

—Albert Cheung, Bloomberg New Energy Finance, May 2017

Figure 4.1: Declining returns for EU and US utilities (p. 30)


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5 https://about.bnef.com/blog/cheung-power-markets-need-redesign-heres/
Figure 4.2: Declining annualized shareholder returns (p. 30)

(Source: Eurelectric, Power Statistics and Trends 2013)

Figure 4.3: Evolution of average solar prices in auctions, Jan 2010-Sept 2016 (p. 33)

Competitive auctions have driven contracted costs of new solar builds dramatically lower—but developers will struggle to deliver at such low prices.

(Source: IRENA, Renewable Energy Auctions 2017)

Figure 4.4: Average bids in reverse auctions in India, 2010-2017 (p. 34)

(Source: Mercom Capital Group, Mercom Exclusive: Solar Tariffs in India Have Fallen by 73 Percent Since 2010.)
**Figure 4.5:** Investment in power capacity, by technology (p. 36)


**Figure 4.6:** ROE on clean energy investments minus COE, public companies 2002-2015 (p. 36)

(Source: OECD, Business and Finance Outlook 2016)

**Figure 4.7:** The evolution of total public and private finance, 2012-14 (p. 36)

(Source: Climate Policy Initiative, Global Landscape of Climate Finance 2015)
Order Over Chaos – Reclaiming Markets (p. 37)

[If we believe that wholesale power markets deliver the most efficient outcomes, then why do we keep adding layers of additional incentives and mechanisms?]

— Albert Cheung, Head of Analysis for Bloomberg New Energy Finance

Part Five: The Return of the State? (p. 38)

Targeted use of public funds to cover early-stage financing and offer guarantees for some of the investment risks can have a significant impact on the sector’s attractiveness to private investors.

—IRENA, RETHinking Energy 2017

The Next Big Target: Institutional Investors (p. 38)

Since the years following the financial crisis and its particular impact on the banking sector, greater attention has been paid to raising debt from the capital markets, and more generally, to accessing the substantial capital held by institutional investors for energy infrastructure investment. These larger volumes of capital will be needed to tackle climate change and the shift to low-carbon economic development.


Who has the money? (p. 39)

Figure 5.1: Global fund management industry, assets under management, 2009, in USD trillions (p. 39)


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7 https://about.bnef.com/blog/cheung-power-markets-need-redesign-heres/
**Figure 5.2: Total assets by type of institutional investors in the OECD, 1995-2011, USD trillions (p. 39)**

(Source: OECD, The Role of Banks, Equity Markets and Institutional Investors in Long-Term Financing for Growth and Development, February 2013)

**United States: Clean Energy Deployment Administration (CEDA) and State Clean Energy Banks (p. 45)**

*This persistent financing challenge demonstrates a clear need for longer-term federal assistance and provides a justification for the creation of a new and permanent agency.*

— American Council on Renewable Energy, June 2013

**Figure 5.3: U.S. total renewable energy investment, 2004-2016 (p. 46)**

(Source: ACORA, The State of Play for Renewable Energy)

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8 2013 http://www.acore.org/resources/news-media/press-releases/3547-acore-releases-new-study-highlighting-key-strategies-to-scale-up-
New Agents? “Green” and “Climate” Bonds (p. 48)

Clearly, a lot more investment is needed to close the gap between where we are today and the money we need to transition the world to a low-carbon economy. Can green bonds be the catalyst to attracting the capital we need?

—Namrita Kapur, Corporate Partnerships Program Environmental Defense Fund, April 2016

To attract private capital, climate investments must fit with the investment preferences of the investors. As institutional investors account for the largest share of the capital pools, and bonds account for the largest share of their investment portfolios, this is where we see the largest potential for climate investments.

—Climate Bonds Initiative

Governments, private banks and lenders such as the World Bank need to issue many more “green bonds” to finance climate-mitigation efforts. This would create an annual market that, by 2020, processes more than 10 times the $81 billion of bonds issued in 2016.

—Mission 2020

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10 https://www.climatebonds.net/role-policymakers-scaling-green-bonds-market-0
The Road Not Taken (p. 51)

Governments have throughout history used various forms of “capital steerage” to shift investment into areas of urgent policy priority. For instance, most of the urban infrastructure that developed countries take for granted – from sewers to railways to aviation and to highways – depended on active government steps to ensure necessary capital investment.

—Climate Bonds Initiative

Issuing of bonds financed infrastructure initiatives over may decades, including national energy grids and generation capacity. Bonds are long-term debt instruments that are repaid at pre-agreed upon rates and guaranteed by governments.

—UNEP 2016

New strategies don’t require going to the lab; they involve applying financing techniques that have already been invented and are used widely in other parts of the economy, but have not yet been applied to the (renewable energy) sector.

—Richard Kauffman, energy and finance chairman for New York State

Conclusion: The Public Pathway (p. 52)

The challenge for unions is to be part of the dialogue that drives investment, shapes industries for sustainability and ensures decent work. Social dialogue, consultation, collective bargaining – workers have a right to be involved in the design of their future.

—International Trade Union Confederation (ITUC), November 2016

You can have renewables. Or you can have the market. You cannot have both…. If renewables are a must-have, then nationalization is the answer.

—Centre for Policy Studies (CPS) UK

An “Energy Armistice” (p. 63)

Investing the money needed to take the early and decisive action on climate change is not about affordability but about our priorities as a society.

—Public & Commercial Services Union, UK, 2017