

Response to EU Proposal on Ecodesign and Energy Efficiency as they relate to Entertainment Lighting - Additional Comments from ALD Members

Association of Lighting Designers, UK

25th January 2018

Andrew Bridge

I have been the Lighting Designer of the world acclaimed musical *The Phantom of the Opera*, which has celebrated its 31st year. Ironically it takes place in the age of gaslight and candlelight which was eventually preceded by the 'new electric light'. I lit all the productions with a majority of Tungsten sources. The quality of tungsten is irreplaceable. It would be a major blow to restrict my palette.

As with all Lighting Designers, I evolve, embracing modern technology constantly but retain the need for older styles and palettes, alternatives are not consistent and are very expensive. The damage that the loss of tungsten along with the enormous costs of total abandonment of equipment would probably be a death knell to many productions even to shows such as *Phantom*.

Progress is welcome but at a realistic pace, other light sources are not quite yet alternatives and a happy marriage is being sought. The prohibited cost of replacing all Tungsten equipment from 2020 due to restricted supply, would be financial suicide to virtually to all entertainment venues. We need time for progress to work naturally and it will. We have always been pioneers. We don't need encouragement, we need time.

(Andrew Bridge is the lighting designer for The Phantom of the Opera worldwide, and countless other shows; he is a winner of 3 Tony Awards and 2 Drama Desk Awards in New York, 2 Dora Mavor Awards in Canada, 2 Ovation Awards and 2 Los Angeles Critics Awards in LA, a National Lighting Award in the UK, and a NAACP Award in the USA. He is a fellow of the Association of Lighting Designers, and a Trustee of the lighting industry charity Light Relief).

David Hersey

While LED Fixtures have certainly improved substantially they cannot be viewed as a 100 percent replacement for everything.

Les Misérables, for example, has been running in the West End for over 30 years using Beamlight followspots and several banks of light curtains. There are absolutely no LED equivalents. The ones which exist do not have the beam quality and could not be considered as replacements.

The thought of never being able to use these light sources doesn't bear thinking about. Will we have to re-light and re-equip existing productions at massive expense whilst throwing on the scrap heap huge amounts of perfectly good and efficient lighting systems.

(David Hersey is the lighting designer for Les Misérables, Miss Saigon, Cats, Starlight Express, Evita and countless other plays, operas, ballets and musicals. He was lighting consultant to the National Theatre in the UK for ten years, and is a past chairman and current fellow of the Association of Lighting Designers. He received Tony Awards for Evita, Cats and Les Misérables in New York, a Drama Desk award for Equus in New York, Olivier Awards for Burning Blue, The Glass Menagerie and Twelfth Night, and the 2017 Knight of Illumination Award for Fiddler on the Roof).

Michael Hulls

Many theatres that can afford to have already invested what they can in LED lighting where it is appropriate and where it achieves efficiencies, for foyers, auditoriums and cyclorama lighting and colour wash units, the higher end LED lights are great for some of these applications and are a useful and exciting addition to the Lighting Designers palette.

But try as they might, and they have tried extensively, no LED or lighting manufacturer has yet been able to come up with anything that can reproduce the particular qualities and behaviour of Tungsten light.

The EU should actually be campaigning to preserve the use of these Tungsten lamps, rather than helping the lamp manufacturers make them obsolete and end production of them, because there is no viable alternative in terms of light quality, optics, colour rendition, subtlety and emotional response.

That by banning these vital and unique tools, that there is no like for like replacement for, they will degrade and destroy the entire repertoire of all European theatre, opera, ballet, contemporary dance, put people out of jobs, close theatre groups, dance

companies, musicals, operas both professional, educational and amateur, and theatres themselves.

(Michael Hulls is a lighting designer for dance and particularly well known for his long-standing collaborations with Sylvie Guillem, Akram Khan and Russell Maliphant. Winner of the 2014 Olivier Award for Outstanding Achievement in Dance, 3 Olivier Awards for Lighting Best New Dance Productions and 2 Knight of Illumination Awards for Dance.)

Rick Fisher

I am a theatrical lighting designer with over 40 years experience working in the UK and around the world designing lighting for productions such as *Billy Elliot - the musical*, *New Adventures/Matthew Bourne's Swan Lake*, and Stephen Daldry's *An Inspector Calls*.

I am desperately concerned about the proposal to remove the current exemption for specialist Tungsten and Tungsten-Halogen light sources.

The quality of light emitted from new and so-called efficient light sources is just not good enough yet, in all but the most expensive fixtures. While richer venues and performance organisations could possibly replace all of their lighting equipment, the thousands of smaller venues, church halls, community centres, fringe venues and places of worship could not afford to. Many of these venues have always relied on hand-me-downs as larger venues have upgraded their equipment - an efficient form of recycling. Here, that model would break down: everyone's lighting stock would become obsolete in a stroke, causing many venues to, quite literally, go dark.

The effect on the quality of light too would be unacceptable. I have had the good fortune to have lit theatre, dance and opera productions that remain 'alive' for over 20 years in the rep of many international companies including the National Theatre, Santa Fe Opera, The Bolshoi Opera, Opera Lithuania.

All of these productions were created around existing equipment much of which does not yet have suitable replacements that can provide the subtlety, colour temperature, and light quality that have been an integral part of their long running success.

Many of the new so-called efficient sources are not as energy efficient as a tungsten lamp that is fully off until the precise moment in a performance when you use it, and which you then

switch off again. And performance lighting has been shown to be only a small part of the energy consumption of any performance venue, so the realised savings of energy would be very minimal compared to the overall energy consumption.

This is not to say that we are not interested in the new sources. I have introduced them into new and old productions when the right equipment becomes available and will continue to do so as the budgets allow.

The desire to save energy is in fact shared by all lighting designers and practitioners, and this change is already happening quickly when suitable tools are available.

A blanket ban would be most counter productive, cause a large amount of specialist equipment to be scrapped, increase the reliance on cheaper imports from third world factories whose environmental impact is not carefully controlled or measured, and seriously risk the smaller producing organisation working with very limited means and local community and grass roots organisation who have only occasional need for lighting equipment and rely on old trusted but still fully serviceable equipment.

(Rick Fisher is Fellow and former Chair of the Association of Lighting Designers, and has been presented with Knight of Illumination Lifetime Recognition Award, 2 Olivier Awards, 2 Golden Triga Prague Quadrennial Awards, 2 TONY Awards, 2 New York Drama Desk Awards, Theatre Lighting Designer of the Year: Live Design Awards, Helpmann Award, Ovation Award, Los Angeles Drama Critics Award. He is a trustee of the entertainment industry charity Backup.)

Patrick Woodroffe

My studio works in many different fields to create lighting schemes for ballet, opera, rock concerts, musicals, special events, architecture, art installations.

Over the last few years, we have welcomed the advent of the LED and the huge benefits it has given us in terms of maintenance, adaptability, and efficient power consumption. Each year this technology gets better, cheaper, lighter, and the fixtures using LED as their source are now providing us with wonderful colour and more manageable and even light output.

But the one source that LED has yet to reproduce with any sort of accuracy is the tungsten bulb. There is currently no substitute

for the rich, creamy and warm light given by the original. We use tungsten sources particularly in the theatre, both as a practical element and also as an effect. The former includes domestic fittings like table and standard lamps used to give authenticity to a scene but also to afford a beautifully soft and forgiving light to an actor's face. And a light as simple as the Parcan gives the same soft and even texture to a scene that is impossible to reproduce elsewhere.

We value and applaud the brilliant efforts of those who have managed to use the LED source to power a new generation of theatrical lighting fixtures. But we feel that the unilaterally banning of a tool that is so important to our craft is a decision that is fundamentally flawed and will limit the ability the freedom and of lighting designers to create as they wish.

(Patrick Woodroffe was the lighting designer for the London 2012 Olympics, is creative director and lighting designer for The Rolling Stones, and is a Royal Designer for Industry.)

Max Keller

Could there come a point where LEDs replace tungsten? I don't know.

At the moment I can't imagine that, but maybe in 20 years. Tungsten fixtures are the backbone of the theatre. Then comes the treats: the daylight, the special fixtures, the projections, the videos. But the basic light is almost always incandescent light, and that's what you have to build upon.

(Lighting designer Max Keller has recently received the German Federal Cross of Merit recognising his long and pioneering career in lighting)

Durham Marengi

Tungsten sources in theatre, film and TV may represent less than 0.001% of the lamps made and sold in the world but the work lighting designers produce as artists is seen by over 90% of the world's population on stage and on screen and TV. Therefore it stands to reason that the opinion of lighting designers as to the best tools for that work to be created should be respected and acknowledged as of some import to our World's Art; it is without doubt in our body of creative consciousness that tungsten is our finest tool.

(Durham Marengi is an award winning lighting designer who works all over the world and is the only British lighting designer to have lit both the Summer and Winter Olympic Ceremonies, most recently in Rio in 2016)

Mark Jonathan

As an experienced lighting designer working in opera, ballet, drama and musical theatre worldwide but notably for the world's greatest opera and dance companies in Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, UK, Spain and Sweden it is impossible to think of the extraordinary waste of physical resources in terms of perfectly usable spotlights and equipment that would become obsolete not to mention the vast quantity of irreplaceable lighting design art that would be destroyed. Would the same arbiters of this proposed, unnecessary legislation destroy works of art, paintings and sculpture because effectively this is what will be done to great Lighting designs that exist in all the répertoires of our most distinguished opera and dance houses.

The equipment to replace the existing spotlights has not been invented yet. The inadequate replacements would bankrupt even the most well endowed company. The time to replace the existing work would be unaffordable in time and lost performance revenue. The outcome would be second rate.

(Mark Jonathan is a lighting designer working internationally, particularly in the fields of opera and dance. He is the Deputy Chairman of the Association of Lighting Designers, and former Head of Lighting of the UK's National Theatre)

Ken Alford

I am technical manager for a small venue - 63 seats. We have a basic lighting rig which is nearly all tungsten, though we are changing to LED cyclorama lighting this year.

Finances are precarious so investment is low. We hire additional kit to fulfil particular production needs. Good LED lighting is very expensive - even to rent.

Although dimming curves have improved, there is still that final blip when the light shuts off having reached their minimum value. And LED fixtures with multiple colours turn each colour off at different times depending on where you are in a colour change. It looks awful.

(Ken Alford is a theatre technical manager)

Ron Hardy

We would like to add our name, the Bingley Little Theatre, to the

growing list of theatres who object to the EU's proposal to ban theatre tungsten lighting by 2020. We are a small local theatre of 350 seats and put on a variety of events from plays to pop groups.

Although we are gradually changing over all our building lighting to LEDs the stage lighting due to its more specialised nature and not being used as much as the general lighting will take much longer to replace for LED's. To be forced to replace all the lighting would be a very expensive outlay for ourselves. Naturally when lights become broken/faulty a modern replacement is sort, thus eventually all the lighting will go over to LED's but this may take longer than 2020.

(Ron Hardy is chairman of the Bingley Little Theatre in West Yorkshire)

Elliot Griggs

I would like to present some data from the play *Fleabag* which has just started an International tour...

In its full capacity, the rig has a total load of 21.8KW. All of it is tungsten, with the exception of one 4' fluorescent tube (36w). Given the show is an hour long, plus twenty five minutes of audience entry and exit, one would assume that the total consumption of power would be 31.3KWH. In reality, each performance uses just 3.88KWH. In comparison, a tea urn in the foyer would use 5KWH for each performance.

The performance itself requires exceptionally high colour rendering for the performer. The show only has a small area of carpet and the performer sat upon a stool. All thirty two location changes are achieved by lighting (and sound effects) alone, and as such a larger number of fixtures are required in order to produce the range of angles to signify all these changes. As such, if this show were to have to tour its own LED rig, the minimum number of fixtures possible would be 19 LED profiles. Given the colour quality required we would need to use high end fixtures so our weekly hires rate would be £950 per week. Given the low capacity spaces the show runs in, this would not be viable. The wattage of the LED rig would be 2.1Kw. Currently the show is able to tour with just the performer, a single stage manager and a suitcase, and only just turns a profit. If the show were to travel with equipment, that would add additional logistics

and technical staff to the tour.

As it stands, no LED fixtures on the market are able to recreate the beautiful colour shifts and tones produced by the tungsten fixtures. All would need to be carefully reprogrammed to emulate this, likely to add days of programming time. If each venue were to provide different LED fixtures, then the show would have to be reprogrammed after every move. There is no equivalence between different LED fixtures. As such the show would then need to tour additional technical staff who were able to reprogram the show each time, again making the tour unviable.

I fully understand why the need for the reduction of tungsten, and saving energy in general. All the lighting fixtures in my home are LED, and I would advocate for all building lighting to be converted to energy saving alternatives. I do specify LED fixtures in my lighting designs where bright, saturated colours are required, or I require a greater flexibility over colour choices, as well as in situations where power supplies are restricted. However I believe outlawing tungsten is akin to banning painters using oil based paint. Oil paint is exceptionally bad for the environment due to the volatile organic compounds they contain. Oil paints, like tungsten, have a specific use, and it's the restriction to anything but that use which works. You wouldn't paint a whole apartment block with oil paint in the same way that tungsten would not be used to light a stadium. Tungsten should be restricted to all but specialist (non-domestic) use lamps, not banned outright. Ultimately audiences will suffer, be it through shows not looking right, or the increased cost causing tours to be untenable or venues being forced to close because they cannot afford to upgrade infrastructure.

(Elliot Griggs is a freelance lighting designer)

Dr Nick Hunt

At Rose Bruford College in London, we have two theatres, two studios and four lighting laboratories, with an estimated 450 tungsten fixtures between them. The nature of the academic cycle means that our production work tends to be clustered in the later part of each term, with the theatres and studios used during the remaining time for teaching, rehearsals and other activities that require little or no stage lighting. The point that has been made that theatre lighting is only on for a few hours a day,

with only a proportion of the rig used at any one time, and often dimmed below 100%, also of course applies to education, but there is this further factor that the theatres and studios are only in full-scale production for perhaps a third of the year on average.

Nevertheless, we require a full stock of equipment to provide students with a suitable inventory to support professional training and education in lighting design and technology.

Higher education institutions are under considerable financial pressure, with capped student fees, the reduction of various other funding streams, and rising costs. The capital costs of replacing our inventory of tungsten fixtures is quite impossible for the small, specialist higher education institutions that provide the professional training and education that our industry relies on. Economically, the return on investment would be negligible, since the energy savings would be low for the reasons noted above.

Also, in terms of the overall environmental impact of tungsten fixtures, these are a mature technology with a potential life span of at least twenty years, and in some cases double that. The embodied carbon from manufacture, and the environmental impact of eventual disposal, are therefore spread across a long life of service, counteracting the carbon associated with their electrical power consumption.

Another point that is perhaps unique to specialist lighting education is that we rely on the 'lighting laboratory' concept as a central part of the training. Students can explore the expressive qualities of light, and develop a creative design process, in the controlled conditions of the model-scale lab. For this we rely on miniature fixtures such as the ETC Source 4 Mini and the Altman Micro-Elipse. While LED equivalents are available, the low power consumption of the tungsten versions, which use MR16 dichroic lamps, means the ratio of cost of replacement to energy saving is even more disproportionate than with full-size fixtures.

(Dr Nick Hunt is Head of School: Design, Management and Technical Arts at Rose Bruford College of Theatre and Performance in London)

Rob Pell-Walpole

As a supervisor at the Guildhall School of Music and Drama in London, the thought of replacing the nearly 700 generic fixtures with led fixtures boggles the mind; even for the City of London, which funds the college, the sums involved are hideous. Looking to achieve this by 2020 is also too narrow a deadline to factor in to the long term financial planning: a capital bid takes in excess of five years.

Even then, the focus for me is what to change to, as there is no like for like replacement. The unique qualities of tungsten in use, CRI and appropriation of the eye and psychology of reading light (infra radiation has evolutionary relevance to humanity through fire and the sun, where as phosphorescence is a rare phenomenon in the natural world)

(Rob Pell-Walpole is a lighting design supervisor at the Guildhall School of Music and Drama in London)

Dave Beattie

I am an amateur lighting designer with over 20 years' experience. Prior to this I have worked professionally as a Lighting Technician in the West End. I work in many venues with 100-700 seat capacity. A tungsten ban would have two immediate impacts on my work:

- the venues would soon have to replace their standard stock of lanterns. The smaller, private venues would struggle to do this quickly and it would drive the rental costs up. The council-run venues (theatres and schools) would be able to change some stock over, but would probably not equip their rigs with the current numbers of lanterns. This would lead to increased lighting hire costs for visiting companies, many of whom already operate at or below the breakeven level.
- my own personal stock of tungsten lanterns would have to be scrapped because I cannot afford to replace them en masse.

To my mind, the most immediate effect of a ban on tungsten would be a rapidly established black market, with supply coming in from outside the EU. This would undoubtedly also lead to increased costs for small companies. At some point in time these companies will be forced to decide between production standards and financial viability, which will damage this part of

the dramatic arts community. Such an unregulated black market might also impact on the safety of the items supplied, with the potential risks of bulbs exploding when they blow. This problem has been thankfully rare over the past 10 years and I would hate to see it return.

(Dave Beattie is an amateur lighting designer with over 20 years' experience).

Nigel Lewis

I am a lighting designer and company director of LX Designs Limited. I serve around 35 theatre and opera companies around the UK. My stock of lanterns is almost entirely tungsten halogen based.

Although I do use hired LED products, I rely on Tungsten lanterns and the supply of Tungsten lamps. If I were unable to purchase tungsten lamps my entire stock of around 60 theatrical lanterns would be unusable and I would have to cease trading.

My lanterns are hired to theatre companies but they are often used at less than full power, and only used for very short periods of time due to

the nature of theatre lighting. I typically change only 2 or 3 lamps per year in my entire stock. Some of my lanterns have had the same lamps in them for the past 6 years and have proved to be highly efficient in their longevity. The small stock of LED lighting in my store has been less reliable than the generic lanterns, some of which I no longer use due to their inability to operate effectively and reliably.

I hire high-end LED products to supplement my tungsten lantern stock but they are still less reliable than my Tungsten lanterns, the complex electronic equipment required to drive the LEDs and the requirement for complex control software, hardware and signal processing equipment is extremely expensive. Whereas the generic fixtures are highly reliable, cost-effective, simple in their use and requirements.

The power consumption of my generic lanterns is typically low due to the limited amount of time each lantern is in use, and I am very careful to limit their use during technical rehearsals to keep power and lamp costs to a minimum.

An EU directive to ban the manufacture of tungsten halogen lamps would directly result in the closure of my company. The replacement cost of my Tungsten stock with LED lanterns would cost in the region of £160,000 which is not a viable option for my small business.

I am also the lead lighting lecturer on 2 college courses. Both would cease to run if the college theatres were not able to use their old stock of Tungsten lanterns, the replacement of all these with LEDs would be prohibitive to both establishments. This would be the fate of many educational establishments.

(Nigel Lewis is a freelance lighting designer and a lecturer in theatre lighting at Kingston College and at the London College of Music)

Michelle Man

I work as an educator and choreographer in a Higher Education Institution with two very well equipped theatres and 6 smaller studio spaces that are also equipped with a lighting rig. All our Undergrad students (500) have access to the use of these materials and performances - dance, drama, circus, multimedia, musical, music - and productions are made with the students throughout the year. The very idea that the tungsten could disappear completely from our theatres, would leave a significant gap in what the students may understand as a genealogy of materials for performance making. Whilst my institution invests generously in theatre materials, I think it would be challenged to replace tungsten materials with high quality LED lighting that produces the same qualitative experience in light/lighting effects.

Over the past thirty years as a dancer and choreographer, I have noticed the qualitative shifts in performance, as some venues have moved away from tungsten in favour of LED features. My current research is attempting to unpick these 'felt sensations' and how qualitative shifts in lighting affect our experiences of being with lighting. I am not resilient to change, but primarily as an educator, I wish future generations of performance makers to be able to continue crafting, designing and making with a wide choice of materials , amongst those, tungsten.

(Michelle Mann is an educator and choreographer teaching Dance and Performing Arts with specialisms in dance techniques, choreographic practice, improvisation)

and composition, performance creation, mentoring of student-led practice and dance writing.)

Charlie Morgan Jones

As a relatively 'new' lighting designer with 10 years professional experience, I felt compelled to voice my opinion on the blanket tungsten ban.

I have been lucky enough to light on all sorts of stages from the West End to the Polish National Opera, from the Eden Project in Cornwall to the miles of underground tunnels at The Vaults in London. However - none of this would have been possible without being given the incredible opportunity to start my career at a plethora of UK Fringe venues - a majority of whom rely on a large tungsten rig.

Should this ban happen, a well known London Fringe theatre will instantaneously lose 49 of its 71 lanterns - nearly 70%, other venues...close to 95%. Replacing those with cheap alternatives would be prohibitive. Replacing them with decent units would bankrupt them. Theatres under arches, above pubs, in pop up tents, in nooks and crannies all over the UK will be forced to close.

How then, will lighting designers of the future hone their craft...in a dark theatre? How will future directors and set designers understand the use of light...in a dark theatre? What will happen to our wonderful creatives? It worries me greatly.

It's important to say - as so many others have - that no source other than Tungsten gives us *that* light. Gives us *that* colour. Has *that* smooth a dimming curve. There's a reason we use it.

No lighting designer I know is a dinosaur - only using lanterns of yesteryear. Where possible we all include other sources of light. We are all keen to use more efficient lighting, however as the market stands at the moment, there is nothing that replaces tungsten like for like and it would be a detriment to the creative industries of Europe to lose it.

(Charlie Morgan Jones is a freelance lighting designer working in theatre and opera in the UK and elsewhere)

Lucy Carter

As a lighting designer who has worked internationally in Ballet, Dance, Opera and Drama for over 25 years I am distressed that there could be a time in the near future when our tungsten lighting fixtures become obsolete and no longer a tool with which we can design with, before any real replacement has been tested and integrated into the lighting stock of theatres and hire companies.

The impact this will have on the theatres I work in across Europe will be devastating. I can not see how many venues will be able to function and continue to produce shows with the large majority of their lighting stock becoming obsolete.

This is especially concerning to me as many of the ballet and dance productions I have designed are in the repertory of major Ballet companies across Europe and the designs will no longer be achievable. How will the ballet companies be able to continue to perform their existing repertory?

It will have a major consequence for the historical repertory going back over many years.

As an example the iconic Wayne McGregor Ballet, Chroma, relies on the combination of Tungsten lights and Fluorescent or LED fixtures for the lighting design, should Tungsten become obsolete then this ballet will not look the same and will have to be redesigned.

But what of the older historic ballet repertoire? These were designed when all that was available was Tungsten, how will those ballets be recreated and maintain their look.

The loss of Tungsten would be devastating for theatre, not only for existing productions but how will our productions fair when we can never have a candle light glow, we can never slowly fade light away and for it to glow and radiate all the way to black without a flicker? I fear it will be a cold and soulless experience.

(Lucy Carter is a lighting designer in fields of ballet, dance, opera and drama, known in particular for her long collaboration with choreographer Wayne McGregor. She is the recipient of an Olivier Award, a TMA Achievement Award, a South Bank Show Award, and 2 Knight of Illumination Awards)

Wayne McGregor OBE

I am very concerned with the European Union's proposed ban of tungsten halogen lights in theatre lighting. In my 25 year career as a choreographer and director I have collaborated extensively with award-winning lighting designer Lucy Carter. Lighting is an essential component of any dance piece, and the quality of tungsten is critical to the aesthetic of my oeuvre, ranging from work with my own company, Company Wayne McGregor, and The Royal Ballet where I have been Resident Choreographer since 2006, in addition to pieces commissioned by numerous prestigious ballet companies worldwide. For example, my Royal Ballet piece *Chroma* which is currently in the repertoire of 13 ballet companies including the USA, Canada, Russia, Denmark, the Netherlands and Australia, relies upon tungsten for its iconic lighting design

Losing this valuable resource, will have a devastating impact not only on the creation and design of future works, but also on the restaging and touring of almost all of my previous work, which all rely on tungsten halogen lamps, including *Wolf Works*, and *Infra* which is on the GCSE syllabus. It appears that the time and money it will take to redesign all of these pieces has not been considered by the EU with their blanket ban proposal, let alone the fact that should the ban go ahead, some of these pieces may never look the same again.

The EU cites environmental concerns with the energy inefficiency of tungsten, however I believe that it is irresponsible and short-sighted to outright ban the use of tungsten in entertainment lighting until a suitable replacement has been tried, tested and properly integrated by the lighting designers and theatre technicians across the industry. My work will simply be unable to be produced for, or tour to, numerous theatres across the UK and Europe which cannot function without a real replacement to the tungsten lighting stock currently in place, as it has been for decades.

I urge the EU to reconsider the extensively damaging effect that this ban will have on artists like myself, my collaborators, and especially the theatres, without which my work would not be seen in its intended form.

(Wayne McGregor OBE is a choreographer of contemporary modern dance, artistic director of Studio Wayne McGregor, resident choreographer at the Royal Ballet in London, and professor of choreography at Trinity Laban Conservatoire of Music

and Drama. He has created work for companies around the world, and served as movement director for films including the Harry Potter series)

Sinead Mckenna

Lighting designers are used to labouring under the constraints of time and with limited resources. We recognise the benefits and potential of LED. Theatres and practitioners everywhere are embracing this technology and employing it wherever possible. It makes sense. It gives us such scope with fewer instruments. We are in a different place than we could have imagined 10 years ago. Even 5 years has seen LED technology flourishing in venues and theatre companies across Ireland exponentially. The assimilation of LED fixtures into traditional rigs has already helped in reducing our carbon footprint, and this continues apace.

While lighting designers recognise the benefits and potential of LED light sources, and theatres and practitioners are starting to embrace it, calling for an out-and-out ban on tungsten will devastate theatre companies across Ireland and the UK. We are not there yet.

Here in Ireland our National Theatre only recently acquired such technology and this still only amounts to a fraction of the rig.

The ban will have a devastating effect on our smaller regional theatres who will have no possibility of switching entirely to LED in 2 years. Doors will inevitably close as lights are switched off across the country. But it will also have a crippling effect on our larger theatres too. No venue here can absorb the kind of devastation that will render entire inventories of equipment obsolete and unusable.

Tungsten is more to me than a means of illumination. Tungsten is a medium. It is unique; brilliant, radiant, alive and alight in a way that LED has not yet rivaled (and maybe never can). There are times when the moment requires the poetry of incandescence.

Lighting is never the same from one production to the next, and the quality of Tungsten is a hugely important component of our palette – it feels like I imagine an artist might feel being denied their favourite medium- to never again employ the lustre, depth and texture of oil paint, but to be restricted to watercolour for

every single painting.

Lighting requires all of its' instruments to tell the story – and tungsten – when needed- is unparalleled. It glimmers and blazes with life; it defies description; its' burning incandescence speaks to our ancient selves in the same way that we respond to fire; deep, instinctual, unquantifiable.

(Sinead Mckenna is a Dublin-based freelance lighting designer working Ireland and the UK)

David Bates

I work in a state school which is already under huge financial pressures.

I have a small rig of 12 stubby PAR 58 and 12 Generic PC lanterns with a further 8 Stubby PAR 58 on stands, all tungsten. As much as I would love to have LED fixtures for there colour mixing and low energy use, I can say with absolute certainty that I will never be in a position to replace them. The cost of new fixtures alone, lest dinners and a new desk, would be nearly two decades of the entire performing arts department budget.

This ban would effectively spell the end of lighting in school for teaching tech skills, lighting GCSE Drama and dance performances. All of which would be so much poorer for it.

(David Bates is the performing arts technician at Bowland High School)

Peter Wright

I am chairman of a small community theatre in Hyde in Greater Manchester. Its main function is as a receiving house for local amateur companies which have no theatre of their own. Additionally we, from time to time, have in-house professional productions (usually Arts Council funded) to allow us to offer quality professional theatre in a fairly deprived area which is also supplemented, from time to time, by touring small scale professional productions.

The venue is run by volunteers and, apart from the occasional grant to help us buy some equipment or add a new facility, we rely solely on income. Our charges for the hire of the theatre are deliberately kept as low as possible to ensure that we remain

affordable, which means finance is always an issue for us. As an example, after several thefts of heating oil we decided we had to change over to gas. The cost of this was £6500 from an annual income of just over £20,000 and around £7000 in the bank. As you can see we don't have much wriggle room.

So to "save tungsten". If a blanket ban on tungsten were to become law in 2020, we would be stuffed. We have 2 spaces. The main house seats 230 and our stock of 80 luminaires ranges from 50 odd year old Patt 123s (18 of them still doing sterling work) to ETC S4 juniors and Parnels and Selecon Acclaims. Our studio space has 41 luminaires with a similar range to the main house.

We are currently looking at how we can move to LED but these need to be fixtures which can dim smoothly, pass, what I call the Lee 152 test and get as close to tungsten as makes little difference but this not going to be cheap. We have 12 x Acclaim profiles on the FoH bar we would need to replace these with 6 x LED fixtures for the downstage wash at a cost of anywhere between £7000 and £12,000. The only way we can do this, is if we get grant funding which is what we are hoping to do later this year. That, of course, still leaves the rest of the stage to fill with light. Another 18 fixtures (Fresnels), so possibly a further £21,000 to £36,000 to find (we are not going to get this from grant funding in a hurry). None of this takes into account "specials" etc. and doesn't even begin to address the needs of the studio space. We couldn't even sell any tungsten luminaires to help fund LEDs as their value would be zero. The dimmers would equally have little or no value. We are fortunate that our lighting desks can cope with LED, moving lights etc but these won't last forever and will need to be replaced at some point.

We could, of course, start buying in stocks of tungsten but how ever much we buy (and we couldn't afford an enormous amount) that is just delaying the inevitable and it is money that could have been spent on purchasing LED at a controlled rate over many years. Also, if there is a scramble to stock up on tungsten, what might this do to the price?

There are hundreds of small amateur and professional theatres out there, along with school drama spaces. As it stands this would be a death blow to all but the richest. In terms of schools this might be another argument to remove drama from the

curriculum.

I am not against LED, we are almost at the stage where all of our house lighting is LED but to expect us to convert to LED entertainment lighting over night is ridiculous. The government have given the car industry until 2040 to sort out producing electric/hybrid cars. Can we have the same time scale?

(Peter Wright is chairman of the Hyde Festival Theatre)

Daniel Robertson

We are a small venue of 207 seats. We have a Tungsten lighting rig of a total of 115Kw that cost us less than £20 a show to run. Over a year our electricity bill would be around £1200 for the theatre. We use 2Kw (CP73's), 1Kw (T19,s), 500w (T18,s) and 1Kw (CP62's) lights. We change very few lamps during each year, about 10 so maybe that costs us £200.

To replace our Tungsten lighting rig with an LED one would cost around £470,000. It would close us down. All lighting other than the stage are LEDs with the exception of the house lights that are a mixture of 20, 35 and 50 watt halogen downlights (total 2.8Kw).

(Daniel Robertson is a technician at the Savoy Theatre, Tonyrefail, Wales)

Graham House

The Swan Theatre in Yeovil is 120 seat Little Theatre Guild venue. We produce six shows per year (each with 6 night run, usually sold out) in a building converted from a pub.

We strive for "professional" standards and our lighting equipment constantly develops as funds allow.

Virtually all of our lanterns (approx 100) are tungsten of varying ages, but their build quality is such that they still do the job and (mostly) don't wear out!

We have experimented with LED fixtures but our conclusion has been that cheap stuff is not very good, better quality has to be paid for and there's no sense in buying one at a time, you've got to do whole areas all at once - big bucks for small folk like us.

The other issue is LED is still under constant development, so a 'buy now, be out of date next year, wish you'd waited' sort of problem tends to stop us doing anything.

We have reasonable reserve funds but hadn't planned on spending it ALL on lighting - a "ban" as early as 2020 would cause major difficulties and require total review of theatre development priorities

Naturally the show will go on somehow - and I guess we are not the only ones planning to order large stocks of replacement tungsten lamps to keep us going beyond the deadline.

(Graham House is responding on behalf of the Swan Theatre in Yeovil, UK).

Bryan Raven of White Light Ltd

White Light is a long standing supplier of lighting equipment to the entertainment industry employing over 200 staff in London. We invest approximately £3m in new equipment every year and sell around £10m of new lighting equipment to our customers every year.

LED technology based fixtures represents approximately 30% of the lighting fittings we currently rent and sell. Customers are still hiring and buying tungsten based fixtures for a combination of financial and quality reasons; high quality LED fixtures are five or six times more expensive than their tungsten equivalent and in many cases there is still no LED equivalent of the light fitting they need.

Based on our current knowledge we envisage it will be at least five years before there are alternatives to every tungsten fitting in use and then another five years before these new fittings are affordable.

So we are looking to at least ten years before we are ready to phase out the use of tungsten fittings.

From a sustainability point of view this is not an issue. Tungsten based fittings (in a performance environment where they are controlled by dimmers) use a tiny amount of electricity. Equally the on-going availability of tungsten lamps allows the continued use of fittings that can be up to thirty years old. Without these lamps the majority of the fittings will need to be scrapped. For

White Light this would mean scrapping approximately 10,000 lighting fixtures.

It is no exaggeration to say that the premature removal of tungsten lamps to the market would be disastrous. The majority of customers could not afford to replace their existing equipment (one customer has estimated it would cost £50k to replace their lighting rig that they currently spend £500 per year maintaining).

From an artistic point of view there are many uses of tungsten for which there is simply no alternative so the implications are huge.

There will be a time when there are affordable alternatives to tungsten fittings but we believe that is at least 10 years away and in the meantime the sustainability argument for phasing out tungsten fittings is unproven.

These lamps will naturally be withdrawn from the market anyway over time by the manufacturers of tungsten lamps as demand falls when there are affordable alternatives available.

(Bryan Raven is the managing director of White Light Ltd, a leading entertainment lighting supplier with a history stretching back more than forty-five years. He is also the chair of Skillscene, a forum for anyone involved in backstage training in the entertainment industry, Vice Chair of the Board of Governors of the National College of Creative Arts, and a trustee of the Putney Arts Theatre.)

Peter Mumford

I think it's fair to say that many if not most of us have now embraced the led 'revolution' that is currently taking place within the world of lighting design - certainly I have. However, the implications of a total ban on tungsten for the theatre and entertainment business by 2020 represent an enormous and unnecessary threat. It's a well established fact that our use of tungsten (which is considerably reduced in recent years) has a minute impact in ecological terms. Rather more important is the wastage of equipment that will occur when theatres and arts managements are forced to scrap perfectly usable equipment because tungsten lamps will be unavailable, quite apart from the capital investment that will be required of many organisations ill funded to deal with the replacement of entire lighting rigs and installations. For many organisations this will be financially

crippling and I see no sign of compensation in this proposed legislation.

We are not 'Luddites' resisting change, but improvements to issues of pollution and an excess use of power must also take a broader view, in this case more than just the light bulb - it's much more complex. Scrapping equipment and manufacturing new hardware all take their toll on environmental considerations in terms of factory output and waste.

Many of us have grown up with beautiful tungsten light - it's embedded in our aesthetic, but things are changing and technology is beginning to offer viable alternatives. It would be quite wrong to simply eradicate tungsten as a useable light source for specialist applications such as Theatre. Just as I believe that it's important that we still have film available despite the digital revolution it's also important that tungsten light sources are retained. There is no reason why tungsten should not be kept available for creative uses and this does not represent an environmental threat in any way.

(Peter Mumford is a lighting designer and director of photography. He is the recipient of 2 Olivier Awards, a Knight of Illumination Award, an Evening Standard Award, a Helpmann Award, a Green Room Award, and an Irish Theatre Award. He is a past Chair of the Association of Lighting Designers.)

Fabiana Piccioli

Sono una Lighting Designer e lavoro con danza, teatro e opera. Vivo in Italia e lavoro in tutto il mondo, il 70% delle mie collaborazioni si svolge in Europa.

Illuminare uno spettacolo in un certo modo, usando determinati strumenti, è il compito del lighting designer. La scelta della qualità della luce ha un impatto essenziale sul risultato dello spettacolo, sul modo in cui il pubblico fa esperienza dell'evento a cui assiste.

Quando mi trovo a scegliere come illuminare una scena e la sua transizione alla successiva, tengo presente innanzitutto l'occhio umano, la visione di quelli che fanno esperienza di uno spettacolo dal vivo

Ho provato in questi anni a rimpiazzare le tradizionali lampade al tungsteno con la nuova tecnologia LED e ho finito per esigere

che si tornasse al tungsteno, poichè il risultato ottenuto coi LED non era soddisfacente.

La maniera in cui il tungsteno fa “vibrare” il raggio di luce e distribuisce la temperatura luce sull’area che va a toccare, non può essere paragonata all’effetto “piatto” e sterile di un equivalente a LED.

Anche i migliori apparecchi di nuova generazione spesso non consentono di bilanciare l’illuminazione, per esempio, di un personaggio e del suo abito bianco. Volendo per esempio “scaldare” la luce sulla stoffa bianca si scivola senza passaggi intermedi su una colorazione giallastra (con più o meno visibili pixel verdi/rossi sulle balze del vestito) mentre la pelle dell’attore risulterà eccessivamente arancione o giallastra, in una colorazione risentita come sintetica.

Una lampada al tungsteno è ancora in grado di raccontare storie, di creare un’atmosfera, molto meglio di qualsiasi antagonista a LED.

Un risultato compromesso dalla qualità della sorgente luminosa inadatta va a detrimento dell’impatto che un lavoro di scena può avere o meno sul pubblico, sulla possibilità di questo di essere coinvolto e trasformato.

il modo in cui una luce al tungsteno sale e scende d’intensità, la gamma di significazioni simboliche e di reazioni emotive che può provocare nel transitare dall’invisibile al visibile: ciò è una componente fondamentale di quanto ricerchiamo nell’esperienza dell’illuminazione in teatro e che ad oggi, in molti casi, è ancora accessibile solo attraverso l’uso del tungsteno.

Una qualità esatta di luce, spesso sottovalutata come inutile sottigliezza, provoca di fatto un maggior investimento emotivo. La specialità del tungsteno dovrebbe essere preservata in teatro perchè propone qualcosa di diverso agli occhi e all’immaginazione.

Per portare in scena l’impression

e della luce del sole, per trasformare la visibilità di un corpo scenico giocando con la vibrazione più flebile della luce,

per questi e per molti altri effetti che facciamo la differenza per uno spettacolo dal vivo, abbiamo bisogno del tungsteno.

(Fabiana Piccioli is a lighting designer base in Rome, Italy, and the recipient of 2 Knight of Illumination Awards)

Paule Constable

This is misguided on so many levels.

Not only do so many of the shows we all know and cherish rely upon tungsten technology, there are all the smaller theatres around the country that absolutely depend upon older tungsten lights and will have no budget available to replace them. Rendering all these older lights obsolete would be unbelievably wasteful. The way forwards is to reduce, reuse, recycle. In the theatre we are remarkably good at this. We don't have the budgets to be profligate.

With this suggested change theatre is being scooped up in a wave that would have a drastic effect on the work we see most of which could not be recreated using LED

LED technology is new and brilliant and exciting but it is different. There is no simple way to replace like with like.

In my own work I use more and more LED units but I use a mixture.

Shows such as *War Horse*, *The Curious Incident*, *Follies*, *Angels in America* - none of them could look as they do without the occasional use of tungsten units.

A blanket ban would be costly - prohibitively so to many. It would change the landscape entirely. And it is assuming a profligacy which we are not party to within the theatre.

We need to be part of a conversation - not victim to a misguided change which has no idea of the repercussions of what is being asked.

I am an award winning international lighting designer. I am also a passionate advocate for change and for embedding sustainability into the world of live performance. I lead on this topic at the National Theatre and am a regular contributor to the

work of Julie's Bicycle. I do not come at this without knowledge...

In the world of live entertainment we are making radical and lasting changes. We are looking at light throughout our public buildings - switching quickly to alternative sources where we can - looking at more efficient use of energy wherever we can.

We are constantly asking the questions.

The link between financial and environmental sustainability is something we are constantly feeding into. More efficiency tends to cost less. Finance officers love this. Look at the success of the wind turbine installed at Glyndebourne Opera.

On the stage technology is rapidly changing. But it would be naive to assume that this technology is at a level whereby it can achieve all that tungsten can.

This conversation is hugely creative and we are learning and learning. The audiences are seeing new things - the juxtaposition of incandescent units with other units is creating a beautiful visual tension.

But the whole thing is a conversation.

To create a blanket ban is to ignore us as artists - to ignore the story telling subtleties of the theatre and to remove an element that every theatre practitioner, every audience member would feel gravely in terms of the quality of what was possible to make, possible to see.

Our use of this tungsten technology is vital to the richness of all of our cultural lives.

(Paule Constable is a lighting designer, and also an associate director of the UK's National Theatre. She is the recipient of four Olivier Awards for Best Lighting Design, 2 Knight of Illumination Awards, 2 Tony Awards, 1 Helpmann Award, 3 LA Critics Circle Awards, the Hospital Award for contribution to theatre, the International Opera Award, 2 New York Critics Circle awards and two New York Drama Desk awards).

The Association of Lighting Designers: www.ald.org.uk

[ENDS]